the OIL AND GAS JOURNAL

TEXAS TECHNOLOGICAL
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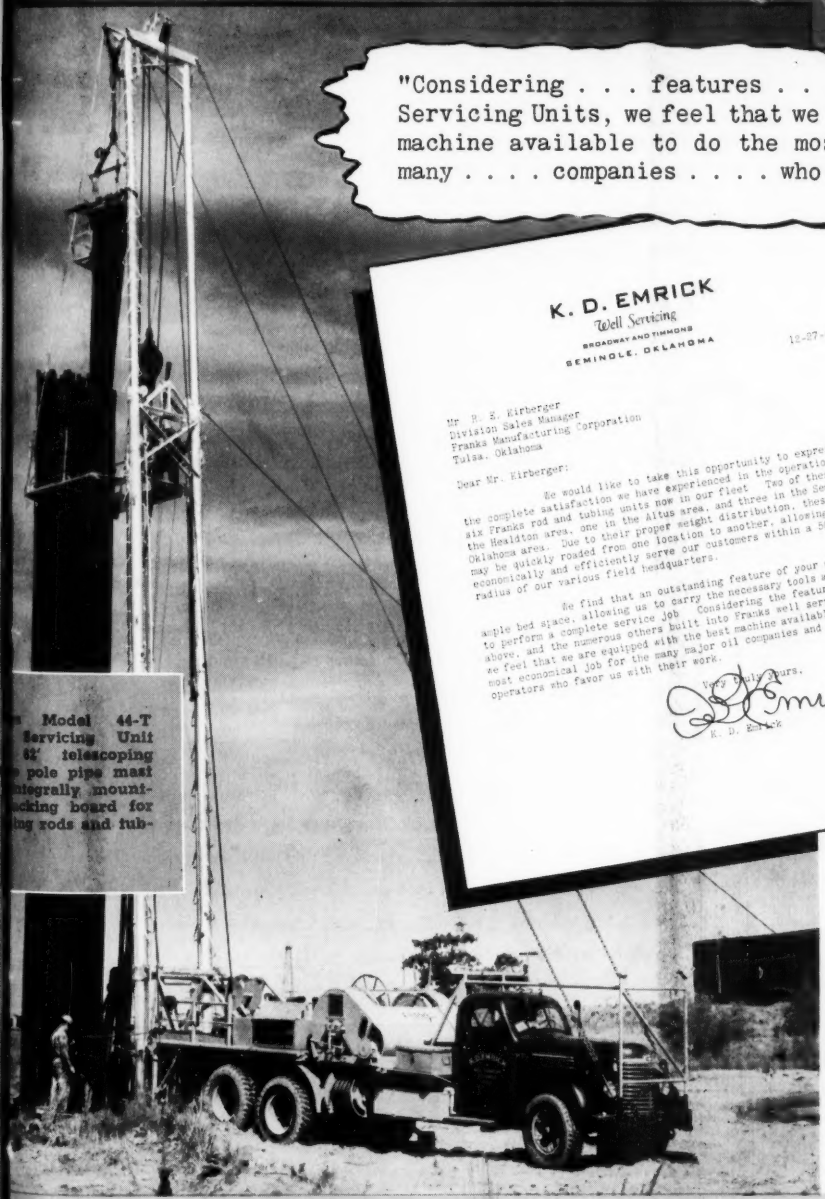
Contractor Equipment he Buys

You Can Judge a ~~Man~~ by the ~~Company He~~ Keeps

"Considering . . . features . . . . built into Franks Well Servicing Units, we feel that we are equipped with the best machine available to do the most economical job for the many . . . . companies . . . . who favor us with their work".



K. D. EMRICK
Well Servicing
BROADWAY AND TIMMONS
SEMINOLE, OKLAHOMA

12-27-48

Mr. R. E. Kirberger
Division Sales Manager
Franks Manufacturing Corporation
Tulsa, Oklahoma

Dear Mr. Kirberger:

We would like to take this opportunity to express the complete satisfaction we have experienced in the operations of six Franks rod and tubing units now in our fleet. Two of these are in the Healdton area, one in the Altus area, and three in the Seminole, Oklahoma area. Due to their proper weight distribution, these units may be quickly roaded from one location to another, allowing us to economically and efficiently serve our customers within a 50-mile radius of our various field headquarters.

We find that an outstanding feature of your unit is the ample bed space, allowing us to carry the necessary tools and equipment to perform a complete service job. Considering the features mentioned above, and the numerous others built into Franks well servicing units, we feel that we are equipped with the best machine available to do the most economical job for the many major oil companies and independent operators who favor us with their work.

Very truly yours,

K. D. Emrick

K. D. Emrick

Look over the co... who use Franks uni... they're always bus... keeping equipment w... is the way to make ...

Model 44-T
Servicing Unit
82' telescoping
pole pipe mast
integrally mount-
acking board for
ing rods and tub-

FRANKS MFG CORP
WELL SERVICING AND DRILLING UNITS
TULSA, OKLAHOMA

FRANKS SALES AND SERVICE:
Main Office: Box 3218, Tulsa, Oklahoma. California: Compton, 909 Alameda Street. Illinois: Mt. Vernon, 1400 Salem Road. Kansas: Great Bend, 10th and Lincoln Sts. Texas: Alice. North Highway 281; Houston, 320 Bankers Mortgage Building; Kilgore, 1800 Longview Avenue; Odessa, 2316 Kermit Highway. Export Office: 149 Broadway, New York, N. Y.

FRANKS UNITS NOW STOCKED BY:
Bovaird Supply Co.
Houston Oil Field Material Co.
Jones and Laughlin Supply Co.

PRICE 50 CENTS

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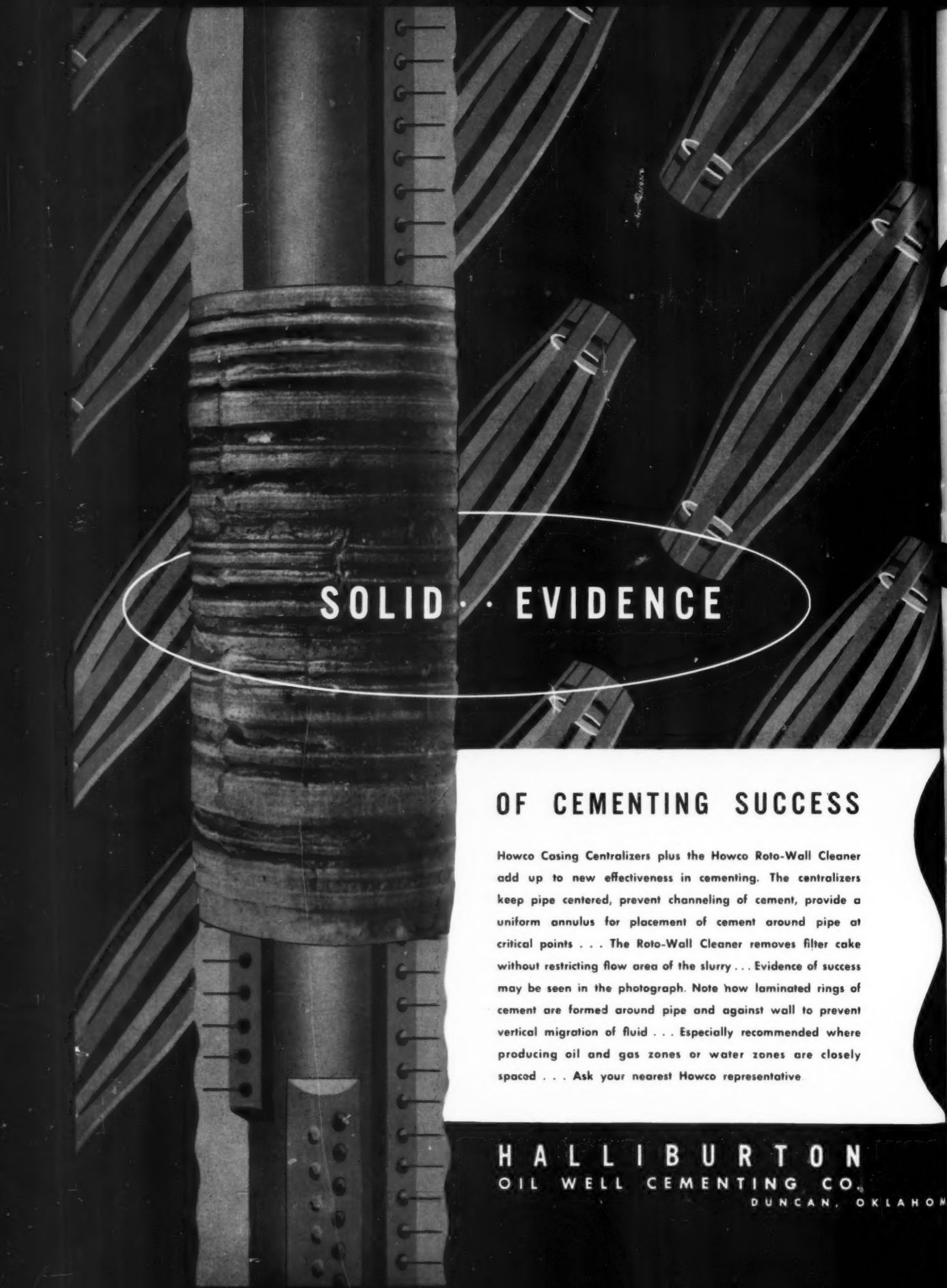

OF CEMENTING SUCCESS

Howco Casing Centralizers plus the Howco Roto-Wall Cleaner add up to new effectiveness in cementing. The centralizers keep pipe centered, prevent channeling of cement, provide a uniform annulus for placement of cement around pipe at critical points . . . The Roto-Wall Cleaner removes filter cake without restricting flow area of the slurry . . . Evidence of success may be seen in the photograph. Note how laminated rings of cement are formed around pipe and against wall to prevent vertical migration of fluid . . . Especially recommended where producing oil and gas zones or water zones are closely spaced . . . Ask your nearest Howco representative.

HALLIBURTON
OIL WELL CEMENTING CO.
DUNCAN, OKLAHOMA

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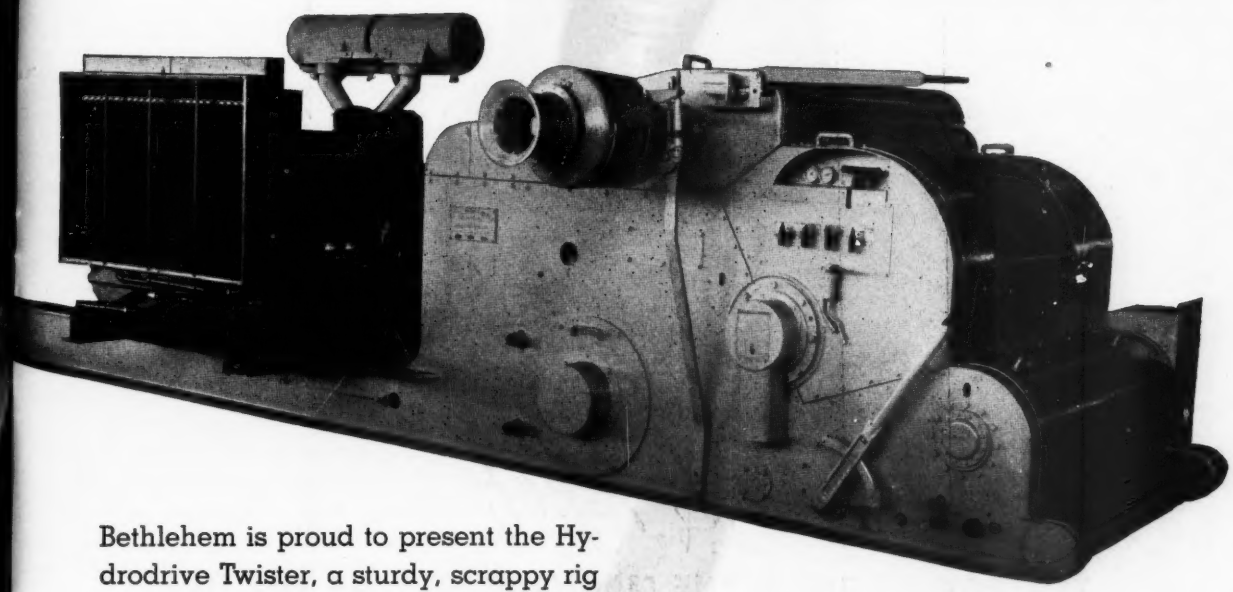
THE *Twister*

another in Bethlehem's distinguished new line of Hydrodrive air-controlled rigs



Bethlehem is proud to present the Hydrodrive Twister, a sturdy, scrappy rig for 6000-ft drilling. It's bristling with torque yet gentle as a kitten in the hands of the driller.

Air controls are the answer. The full potential of this air-controlled rig is at the driller's beck and call, inches from his hands. A touch of the fingers and the single-engine power flows smoothly, instantly responding to his wish.

Hydraulic drive . . . 100% pneumatic controls...all self-adjusting air clutches . . . these are some of the Twister's features. Ask for full details; or better yet, step behind the controls and get the feel of the Twister yourself.

BETHLEHEM SUPPLY COMPANY
General Offices: 21 E. Second Street, Tulsa, Okla.
Subsidiary of Bethlehem Steel Corporation

On the Pacific Coast Bethlehem Oil-Field Equipment is sold by Bethlehem Supply Company of California

★ BETHLEHEM STEEL ★

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At Brown & Root

THE RABBIT PULLS THE MAGICIAN OUT OF THE HAT

Constant development of scientific principles through research is the order of the day at Brown & Root. Conventional methods of construction are thoroughly exploited for improvement. Modern industrialists know therefore the latest and best in engineering "know-how"-through-research is available always for their construction needs.

Large industrial, chemical and petro-chemical plants throughout the world attest to Brown & Root's skill in doing a complete job for their clients. Staffed by experts in economic planning, engineering design and erection, Brown & Root solves all construction problems from site location to operating plant.

At your invitation, one of Brown & Root's staff of experts will be happy to call on you to discuss your construction and expansion plans. Of course, there is no obligation involved.

BROWN-BILT

BROWN & ROOT, Inc. *Engineers ▲ Constructors*

P. O. BOX 3, HOUSTON 1, TEXAS

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How to INCREASE BOILER RATINGS with your present furnace and stack

Coppus-Dennis FANMIX Burners Give You More Heat with No Other Major Change in Equipment

Coppus-Dennis **FANMIX** Burners give you *perfect* mechanical mixing of fuel and air *at the burner outlet . . . instantaneous* ignition close to the burner . . . and *complete* combustion *without visible flame* when burning natural gas. No other burner combines these three advantages.

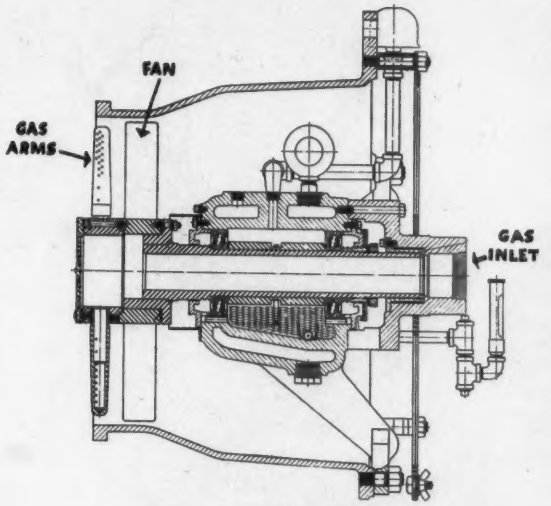
Because **FANMIX** delivers the *right* mixture of fuel and air *without blow-torch action*, all of your furnace space is used for combustion . . . *none for mixing*. That's why your present furnace can release more heat . . . why new installations can get more heat out of smaller furnace space.

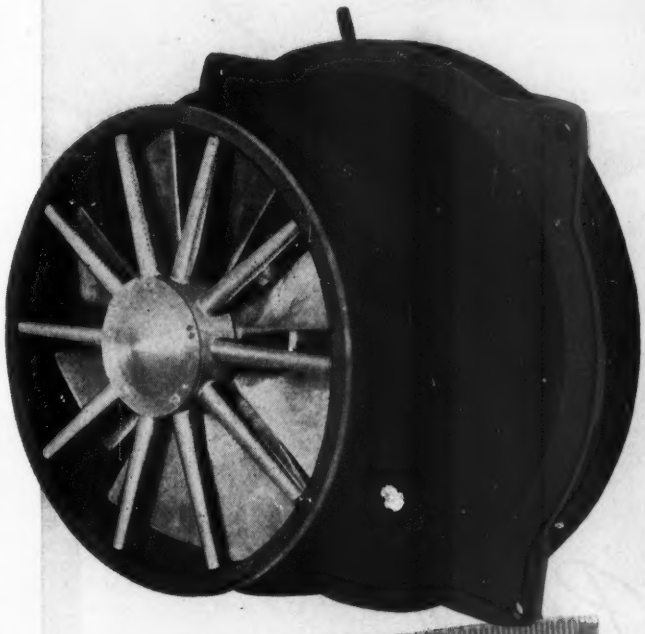
Because **FANMIX** can be guaranteed to secure complete combustion of natural gas *with less than 5% excess air*, you get uniform "radiant heat" *without drifting hot spots*. That's why a **FANMIX**-fired furnace seldom varies in temperature more than 5% over its entire area.

WRITE FOR ALL THE FACTS

When you see in Bulletin 410-6 how fuel escaping from orifices in rotating driver arms rotates the fan to draw the correct proportion of air into the path of the fuel at right angles . . . how **FANMIX** creates its own forced draft, reduces stack requirements, prevents cracking of "wet" gas . . . how two **FANMIX** types handle either gas or oil or any combination of both — you'll understand why **FANMIX** Burners have such wide acceptance in oil refineries and power plants.

Send for the Coppus-Dennis **FANMIX** Bulletin 410-6. Coppus Engineering Corporation, Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other Coppus "Blue Ribbon" products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, and REFINERY CATALOG.





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"BLUE RIBBON" PRODUCT

COPPUS ENGINEERING CORP.
262 Park Ave., Worcester 2, Mass.
Please send Bulletin 410-6 to:

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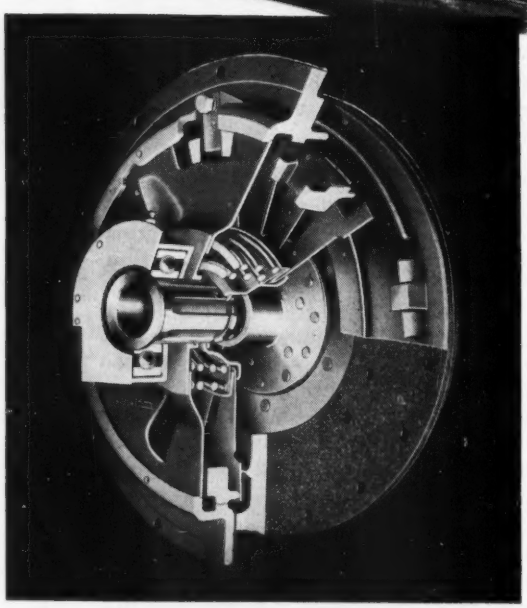
Beautiful Action

exemplified to the highest degree in automotive power transmission in the Spicer Brown-Lipe and Auburn Clutches



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Division of Dana Corporation
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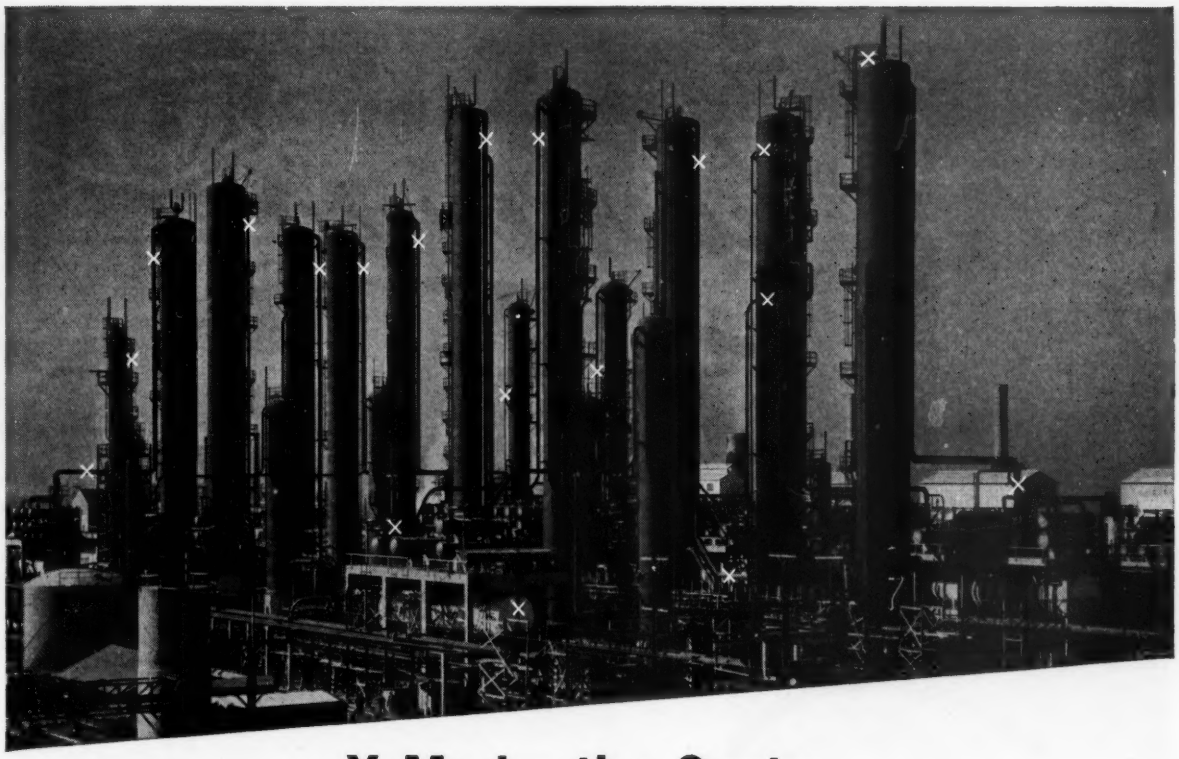
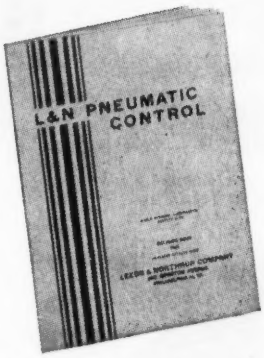
45 YEARS OF Spicer SERVICE

TRANSMISSIONS • PASSENGER CAR AXLES • CLUTCHES
PARISH FRAMES • STAMPINGS • TORQUE CONVERTERS • UNIVERSAL JOINTS
SPICER "BROWN-LIPE" GEAR BOXES • RAILWAY GENERATOR DRIVES



X Marks the Spots For Speedomax Pneumatic Control



Here's A New Catalog You Can't Afford To Miss

Suggested uses for this controller, and a description of its operation are presented in this new 24-page catalog.

In addition, the catalog lists our Micromax and Speedomax Pneumatic Controllers for temperature, per cent SO_2, electrolytic conductivity and pH. Ask for catalog ND4B.

Can a refinery operate at maximum yield with just one general type of temperature controller for most of its needs? Engineers in at least one plant used to think not, but a recent experience now makes them suspect that the new, complete, L&N Pneumatic Controller can replace many of the controller types formerly used.

Tower Was In Trouble

In this plant, a tower-top instrument recently had to be replaced because it started failing to hold the 215F top temperature within limits. The only stand-by controller was a standard Speedomax of 0-1000F range. This range is of course not right for tower top, but the tower was in trouble; some instrument had to be found at once. Speedomax was rushed into service without even time to change its range.

Speedomax Ended Control Difficulties

Results were far beyond expectations. For example — when the operator had to lower the control temperature by only two degrees, Speedomax handled the change immediately, without overshooting, even though the control point was way down scale and the range was wrong. In fact, Speedomax gave better control than other instruments having the special range, etc., for tower top control.

Speedomax Control Is Complete

Reasons for such success are the sensitivity of Speedomax plus the complete L&N Pneumatic-Control System. The Control's Rate Action is highly stable—thoroughly resistant to upsetting factors. The control point moves only when the operator moves it by hand. Automatic droop correction and bumpless transfer from manual to automatic operation are among other features. For information write Leeds & Northrup Company, 4959 Stenton Avenue, Philadelphia 44, Pa.

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

LEEDS & NORTHRUP CO.

Jrl. Ad N-33-702(9)

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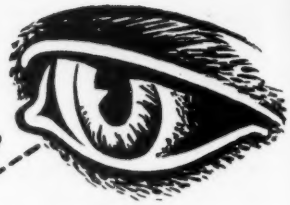
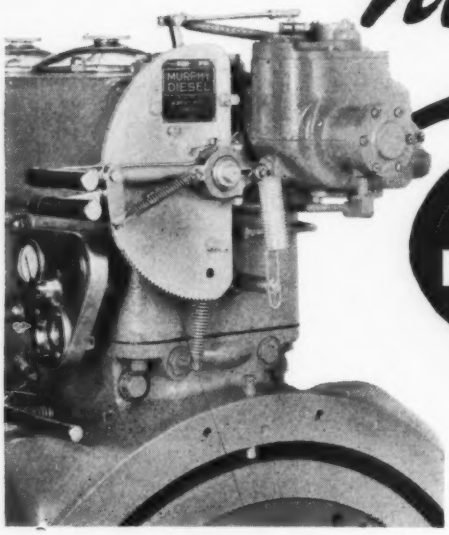
"MURPHY DIESELS have eyes"





the hydraulic servo-type governor provides instantaneous response to load changes!

The response of Murphy Diesels to load changes is so immediate that operators in the field have remarked "The Murphy Diesel has eyes!" The engine seems to foresee in advance demands for increased power.

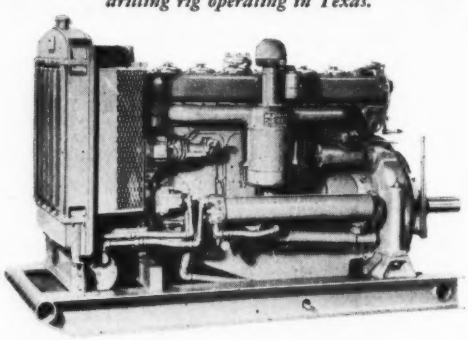
This instantaneous response is made possible by the hydraulic servo-type governor which harnesses lubricating oil pressure to adjust injector controls to meet changing power requirements. The governor flyweights serve merely as a control. By utilizing the powerful pressure of the lube oil the action of the governor is accurate and immediate throughout the speed range from idling to full speed. In the event lubricating oil pressure falls below a safe level the governor automatically shuts off the engine protecting it against possible damage.

The engine itself responds unfalteringly to the governor's control because it is a "true" diesel—solid fuel injected directly into a plain open combustion chamber. Murphy Unit Fuel Injectors, which eliminate all high pressure fuel lines, make possible smooth, precise injection.

Get full details from your Murphy Diesel Dealer. And be sure and ask him for a copy of the helpful bulletin, *"7 Questions to Ask a Diesel Engine Salesman"* or write to:

MURPHY DIESEL COMPANY
5305 West Burnham St., Milwaukee 14, Wisconsin

Two Murphy Diesels are used here to power a rotary drilling rig operating in Texas.



Murphy Heavy-Duty "True" Diesel Engines and Power Units, 90 to 215 H.P. Generator Sets 60 to 115 K.W., A.C. or D.C.

MURPHY DIESEL

LOWEST ULTIMATE POWER COST

FACTORY BRANCH—SALES, PARTS and SERVICE
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For any refinery piping job . . .
Crane has everything you need

Take This Steam Utility Piping, for example. All valves, fittings, fabricated piping, pipe and accessories shown here typify the unequaled selection you get at Crane. Whether the fluids you are handling call for brass, iron, steel or corrosion-resistant alloys, most likely Crane has the equipment you need. And you get it all on one order to your nearest Crane Branch or Wholesaler.

Relying on this **One Source of Supply** is the way to make the most of any standardization program. For the Crane line is complete enough to simplify every piping procedure, from design to erection to maintenance. **One Responsibility** for materials—all designed to rigid refinery specifications—helps you get better installations, avoids needless delays. **High Quality** in each item from Crane helps to assure efficient, dependable performance throughout piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE SOURCE OF SUPPLY
RESPONSIBILITY
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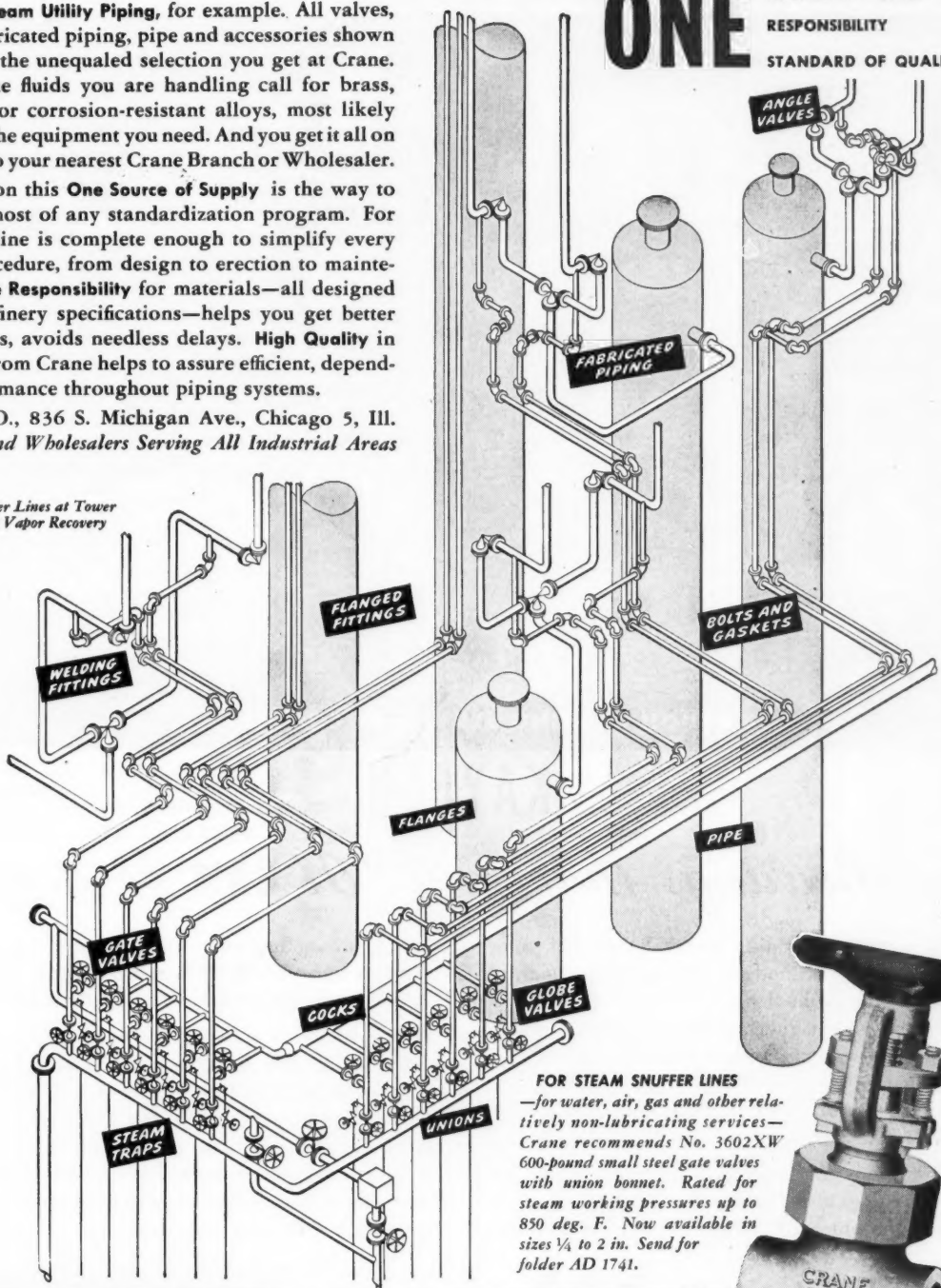
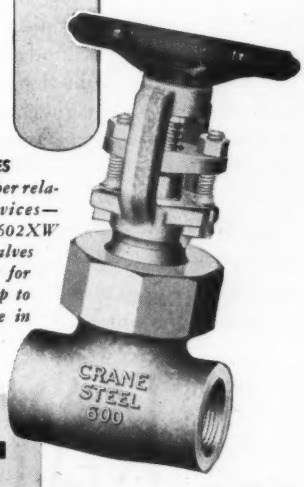


Steam Snuffer Lines at Tower Structure on Vapor Recovery Unit.

FOR STEAM SNUFFER LINES
—for water, air, gas and other relatively non-lubricating services—Crane recommends No. 3602XW 600-pound small steel gate valves with union bonnet. Rated for steam working pressures up to 850 deg. F. Now available in sizes ¼ to 2 in. Send for folder AD 1741.



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VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

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FOR EVERY PIPING SYSTEM

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Contact KAYDON *of Muskegon*

FOR ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER

KAYDON

The Bearings that say: "It CAN *be done!"*

KAYDON Bearings are helping to "make dreams come true" for designers of modern machinery now making the most of the technological advances of the past several years. Heavy-duty machines capable of greater speed, heavier loads, greater precision in performance, longer life . . . machines capable of greater production at lower costs . . . are being engineered with **KAYDON** bearings.

The **KAYDON** line is so complete, with such a broad line of types and sizes of ball and roller bearings . . . from 4" bore to the unusually large 120" outside diameter bearings. . . . that many former handicaps to design are now removed. **KAYDON** Bearings have become known as the line that helps designers say: "It CAN be done!"

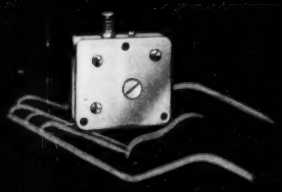
KAYDON also offers manufacturers of precision parts the following modern facilities and services: Atmospheric controlled heat treating, precision heat treating, salt-bath and sub-zero conditioning and treatment, microscopy, physical testing and metallurgical laboratory services. • Counsel in confidence with **KAYDON**. Engineers who are specialists in modern bearings will gladly cooperate with your organization.

KAYDON *Types of Standard or Special Bearings:*
Spherical Roller • Taper Roller
Ball Radial • Ball Thrust
Roller Radial • Roller Thrust

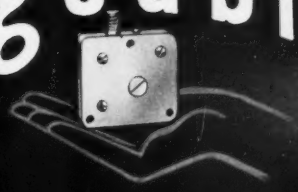
THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

AN "EYE-OPENER" IN



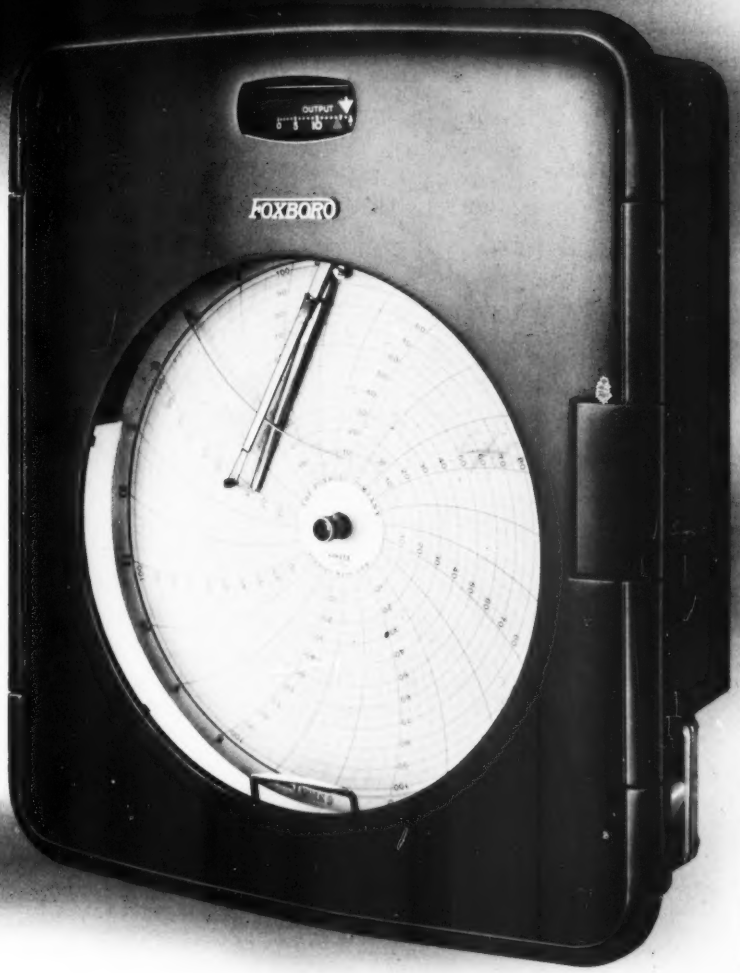
Interchangeability



OF PARTS

THE EASY, trouble-free interchangeability of M-40 parts makes instrument men sit up and take notice. For this is an ace in the hole to them in case of emergency. It means the end of time-wasting, costly delays in fitting and adjusting replacements of parts accidentally damaged.

This interchangeability of parts is no happenstance. Every part was designed to eliminate variations that might necessitate critical field adjustments . . . and vital parts were built to machine tool precision. In the eyes of expert instrument men, interchangeability is another important advantage that makes M-40 the outstanding modern controller.



FOXBORO REG. U. S. PAT. OFF. *M-40*

"THE FINEST MODERN CONTROLLER"

AN "EYE-OPENER" IN DUPLICATION OF PARTS

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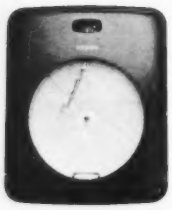
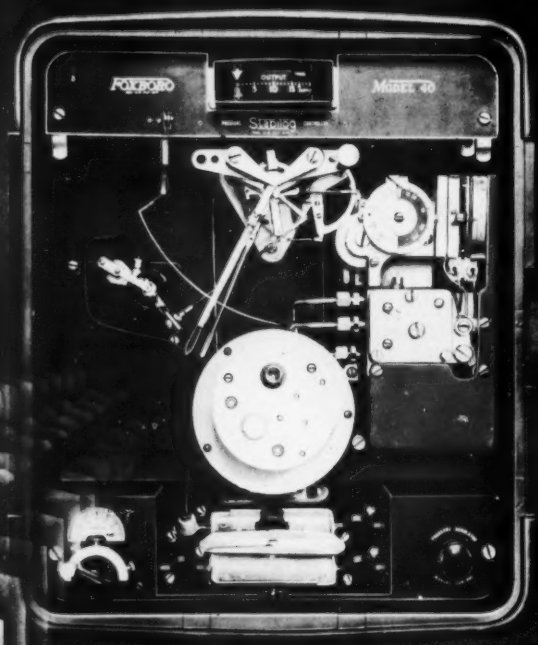
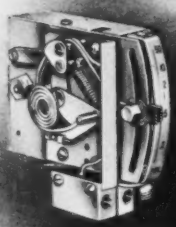
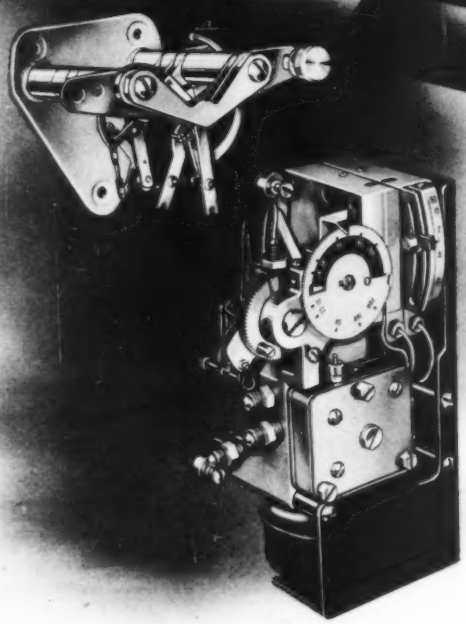


The Model 40 Pneumatic Controller is available for temperature, pressure, flow, liquid level, humidity, density, etc., in a full range of control actions and combinations. Write for Bulletin 381. **The Foxboro Company, 262 Neponset Avenue, Foxboro, Mass., U. S. A.**







Identical Performers

because simplified unit construction makes duplication of parts easy

All main and sub-assemblies of the Model 40 Controller may be interchanged freely without impairing the accuracy and stability of the instrument. If, for example, the control relay should ever need replacing, another may be easily substituted with positive assurance that it will restore the original performance characteristics.

A closer examination of the control relay shows that its design and construction are so basic, so free from complicated parts and critical adjustments, that there are no manufacturing problems in turning out duplicate performers. It also shows that proper alignment of control relay with other parts is automatically assured.

This advanced engineering, typical of M-40 design and construction, is another important reason why M-40 is the finest modern controller.

FOXBORO
REG. U. S. PAT. OFF.

M-40

"THE FINEST MODERN CONTROLLER"

Sure Cure for gas or liquid leaks

No. 304-N Sylphon Packless Valve comes in sizes from ½" to 2" for pressures up to 150 lbs. Also available in larger sizes is No. 1304 with flanged connections for liquid pressures up to 80 lbs. No. 304-NV is ideal for vacuum service.

SYLPHON packless valves

● Even tiniest leaks of valuable liquids or gases are *stopped*—with Fulton Sylphon Packless Valves. Installed on pipe lines carrying oil, gasoline, or other volatile liquids or vapors, these valves prevent waste—provide vacuum protection. They guard you and your equipment against costly losses, explosion, fire, and other damage.

The valve has a dual-ply, seamless Sylphon metal bellows instead of the customary packing—eliminating leakage that can seep past the stuffing box of an ordinary packed type valve. The bellows provides a positive seal—is metal-housed for protection against erosion. Available in many sizes and types with body made of brass, bronze, cast iron, cast steel, stainless steel or monel.

Widely used in chemical plants, oil refineries, power plants, aboard ships—or wherever steam, air, gases or liquids are handled. For complete information, please write for Bulletin CF-813.

Temperature Controls • Bellows Devices • Bellows Assemblies

FULTON SYLPHON
DIVISION

FIRST WITH BELLOWS

ROBERTSHAW-FULTON CONTROLS CO., KNOXVILLE 4, TENN.

Canadian Representatives, Darling Brothers, Montreal

XUM

Well Servicer Doubles Pipe-Pulling Output ...with Less Man Hours

In one of Oklahoma's biggest oil fields, an FWD six-wheel drive truck is helping a producer slash pipe-pulling and well-drilling costs . . . by transporting heavy time-saving gear to off-the-road locations quickly, safely, economically.

In an eight-hour day, here's what this FWD, equipped with a Frank's mast does: Pulls 7100 ft. of 2½-inch tubing — and does it in 4 hours *less* time — with *less* manpower than the older type of rig. When drilling, this same FWD unit cuts $14 per ft. from conventional rig costs.

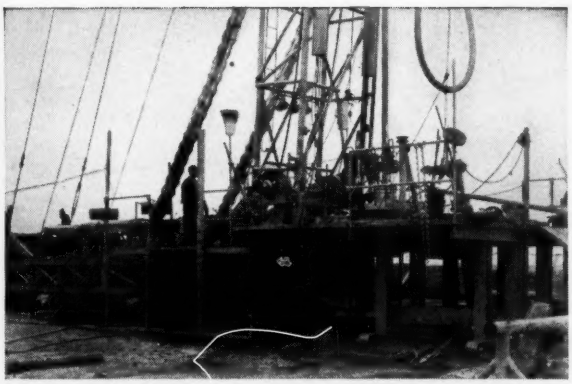
No matter where you go, you'll find powerful FWD four-and six-wheel-drive trucks doing the tough jobs . . . saving money for their owners. To get all the facts, see your nearest FWD distributor, or write —

THE FOUR WHEEL DRIVE AUTO COMPANY
CLINTONVILLE, WISCONSIN
Canadian Factory: Kitchener, Ont.

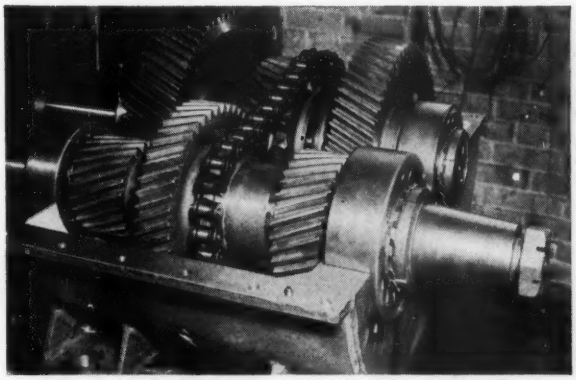
FWD
America's Foremost Heavy-Duty Truck

Torrington Spherical Roller Bearings

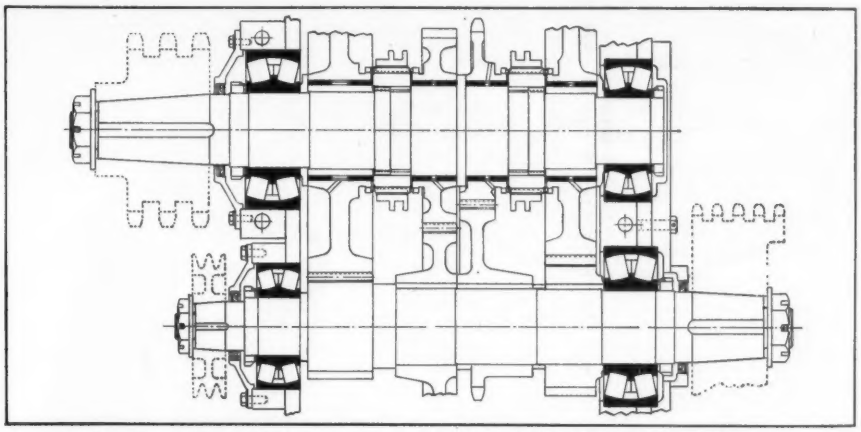
Put Horsepower in Working Harness



Heavy-duty work harness for horsepower are the four Torrington Spherical Roller Bearings in the Model 2,000 Transmission. Built by Cardwell Mfg. Co. of Wichita, Kansas, this transmission is rated at 2,000 foot pounds at 1,000 rpm to operate the Cardwell Trailerig and other oil field equipment.



There are three problems in the design of transmissions . . . radial load, axial thrust of the helical gears, and maintenance of shaft alignment. In this CARDWELL Transmission, the Torrington Spherical Roller Bearings are positioned to handle all three. They compensate freely for deflection, prevent stress concentrations.



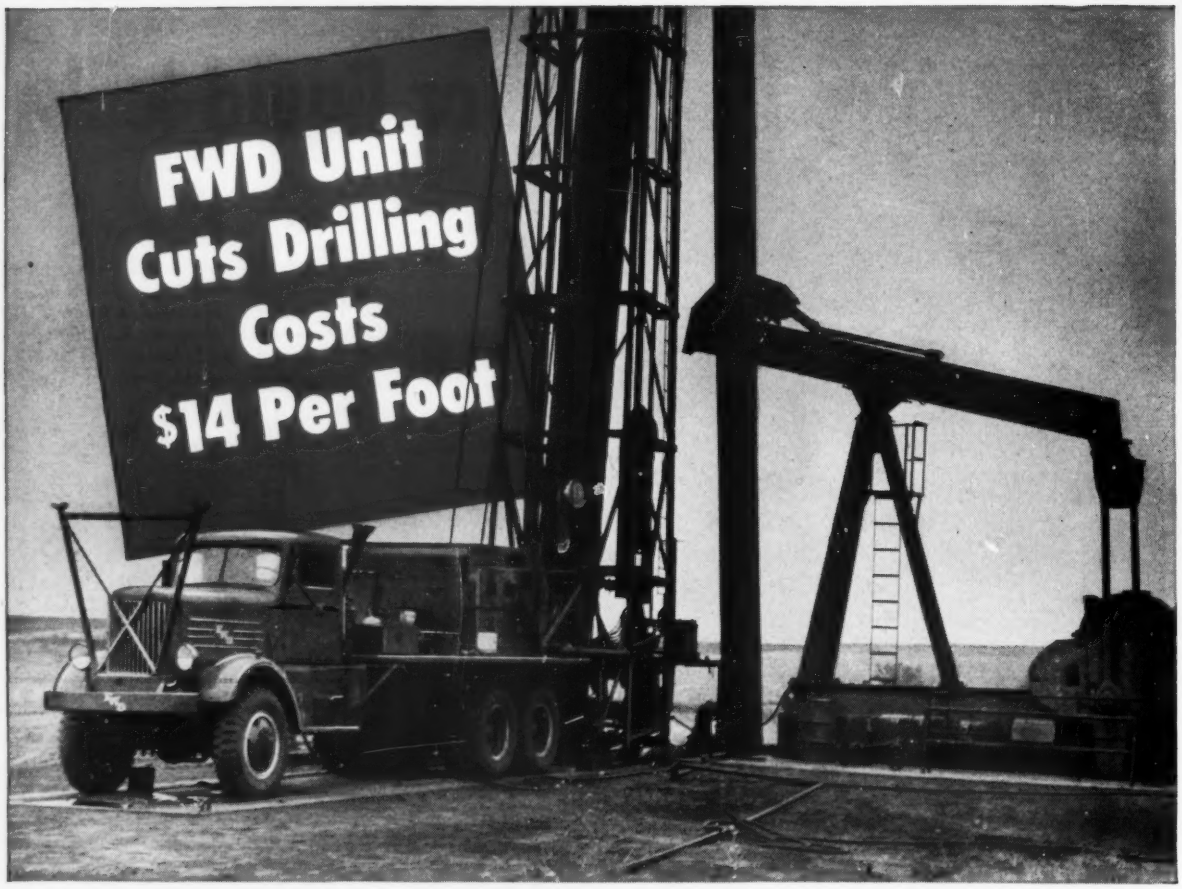
Cross-section shows the simple design incorporating Spherical Roller Bearings. The high capacity of these units means long years of service life. Interesting, too, is the use of Torrington Needle Rollers under gear and sprocket drives, affording maximum capacity in minimum space.

Power transmission is only one of many places where Torrington Spherical Roller Bearings can increase service life and reduce maintenance requirements. To help you with your friction problems, we offer our years of experience in designing, building and applying all major types of anti-friction bearings. Call or write the nearest Torrington office. THE TORRINGTON COMPANY, South Bend 21, Ind., Torrington, Conn. District offices and distributors in principal cities.

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Straight Roller Needle • Ball • Needle Rollers

XUM



Well Servicer Doubles Pipe-Pulling Output ...with Less Man Hours

In one of Oklahoma's biggest oil fields, an FWD six-wheel drive truck is helping a producer slash pipe-pulling and well-drilling costs . . . by transporting heavy time-saving gear to off-the-road locations quickly, safely, economically.

In an eight-hour day, here's what this FWD, equipped with a Frank's mast does: Pulls 7100 ft. of 2½-inch tubing — and does it in 4 hours *less* time — with *less* manpower than the older type of rig. When drilling, this same FWD unit cuts $14 per ft. from conventional rig costs.

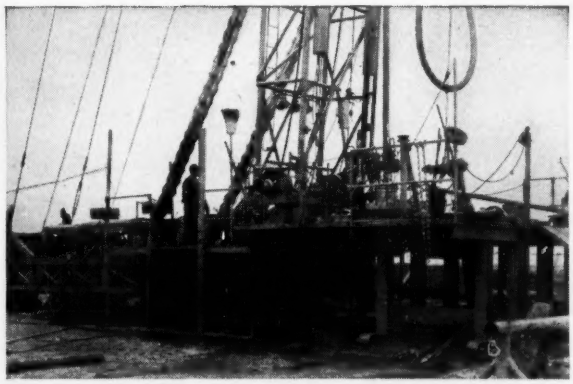
No matter where you go, you'll find powerful FWD four-and six-wheel-drive trucks doing the tough jobs . . . saving money for their owners. To get all the facts, see your nearest FWD distributor, or write —

THE FOUR WHEEL DRIVE AUTO COMPANY
CLINTONVILLE, WISCONSIN
Canadian Factory: Kitchener, Ont.

FWD
America's Foremost Heavy-Duty Truck

Torrington Spherical Roller Bearings

Put Horsepower in Working Harness



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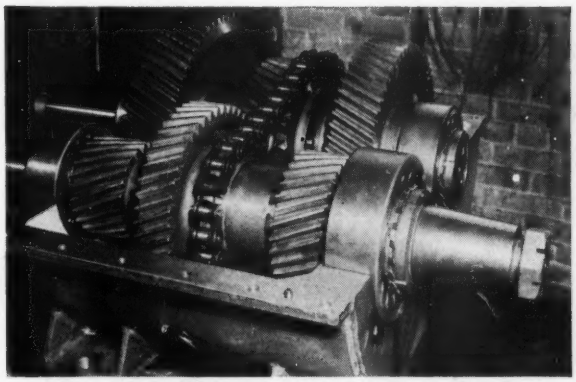

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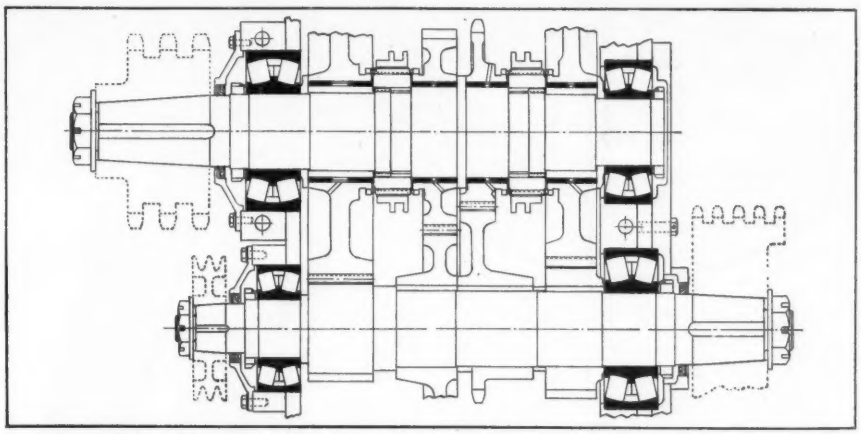

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TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller Needle • Ball • Needle Rollers

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Cylindrical
Plug
gives
full pipe area
The result is smooth, non-turbulent flow...lowest head loss... reduced valve abrasion. Yet compact plug valve construction is retained.

a.c.f. CYLINDRICAL LUBRICATED FULL PIPE AREA PLUG VALVES

Representatives in more than 50 principal cities.

A.C.F. Plug Valves are ideal where the lading is viscous or contains suspended solids. Write for catalog No. OG-9 direct to American Car and Foundry Company, Valve Division, 30 Church Street, New York 8, N. Y.

RUSH SHIPMENT IS STANDARD PRACTICE IN THE GASO PARTS DEPARTMENT

It pays to look ahead when buying pumps. The sturdiest specimens—yes, even Gaso Pumps—may some day be forced down by wear of or damage to a part. At Gaso every parts order is a call for emergency action. Precision-machined parts are selected from carefully maintained stocks, checked against complete records and rushed by quickest means to destination. Replacement is speeded, shutdown time reduced. Another reason why you get more for your money when you specify Gaso Pumps.

GASO PUMP & BURNER MFG. CO.
902 EAST FIRST ST., TULSA, OKLA.
Export Office: 149 Broadway, New York
Shreveport and Odessa: W. L. SOMNER CO.
Los Angeles: PRODUCTION EQUIPMENT CO., Inc., 651 E. Gage Ave.

GASO PUMPS
for every oil industry need

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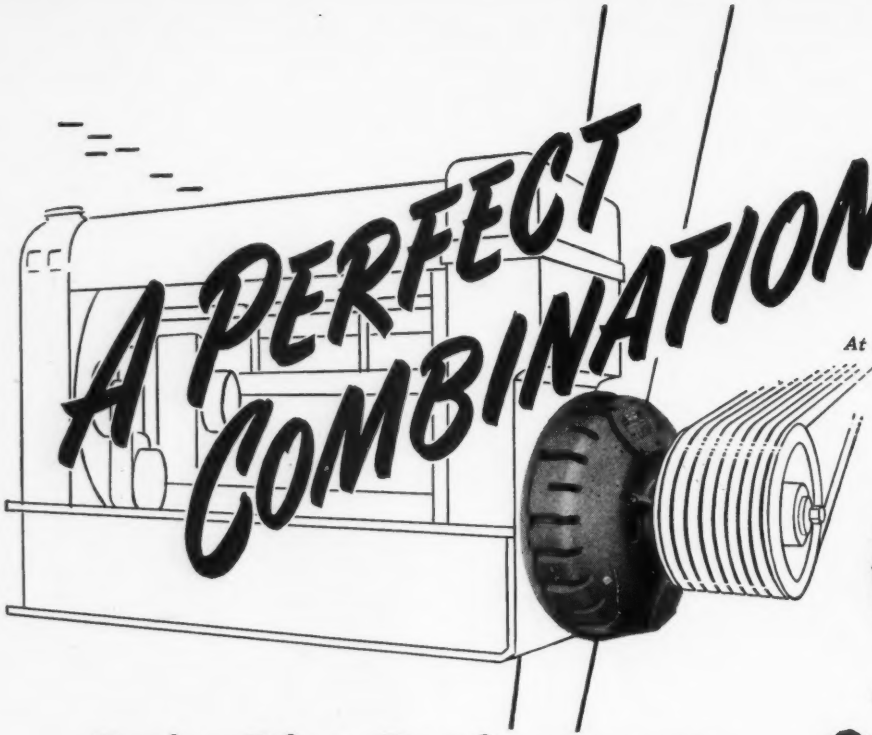
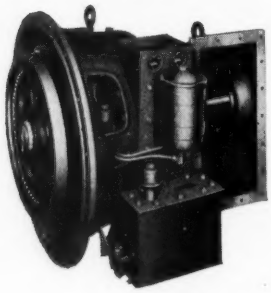


A PERFECT COMBINATION

At left: Hydraulic Power Take-off

Hydraulic Coupling

Twin Disc Performance and Twin Disc Service



Hydraulic Torque Converter

Twin Disc Hydraulic Drives—Couplings, Power Take-offs and Torque Converters—combine perfectly with most internal combustion engines to deliver a smooth, flexible, non-stalling flow of power to your equipment.

This is only half of Twin Disc's perfect combination. This performance is backed up by a comprehensive nationwide service organization that has five factory branches and 54 Authorized Twin Disc Parts Stations as its basis.

These Parts Stations maintain complete stocks of Twin Disc parts in usual demand . . . have facilities for repairing and overhauling all Twin Disc Friction Clutches and Hydraulic Drives . . . are staffed by factory-trained engineers and mechanics.

Availability of replacement parts and convenient, reliable service are as important to you as the performance of Twin Disc units. Together, they can't be beat . . . they assure you efficient, uninterrupted power transmission for your equipment.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

GOT A SICK WELL?

Bovaird has the Remedy!

SUPPLY
BOVAIRD
COMPANY

OFFICES AND STORES

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KANSAS—Chase, McPherson, Pratt, Russell, Wichita
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Down time means lost time and money. You can keep this costly down time to a minimum by using the Top Quality products stocked by the Bovaird Supply Co. stores. These stores are strategically located throughout Kansas, Texas, Illinois and Oklahoma to give you quick, dependable service when you need it most.

"Buy From Bovaird"

THE BOVAIRD SUPPLY CO.

GENERAL OFFICES: TULSA, OKLAHOMA

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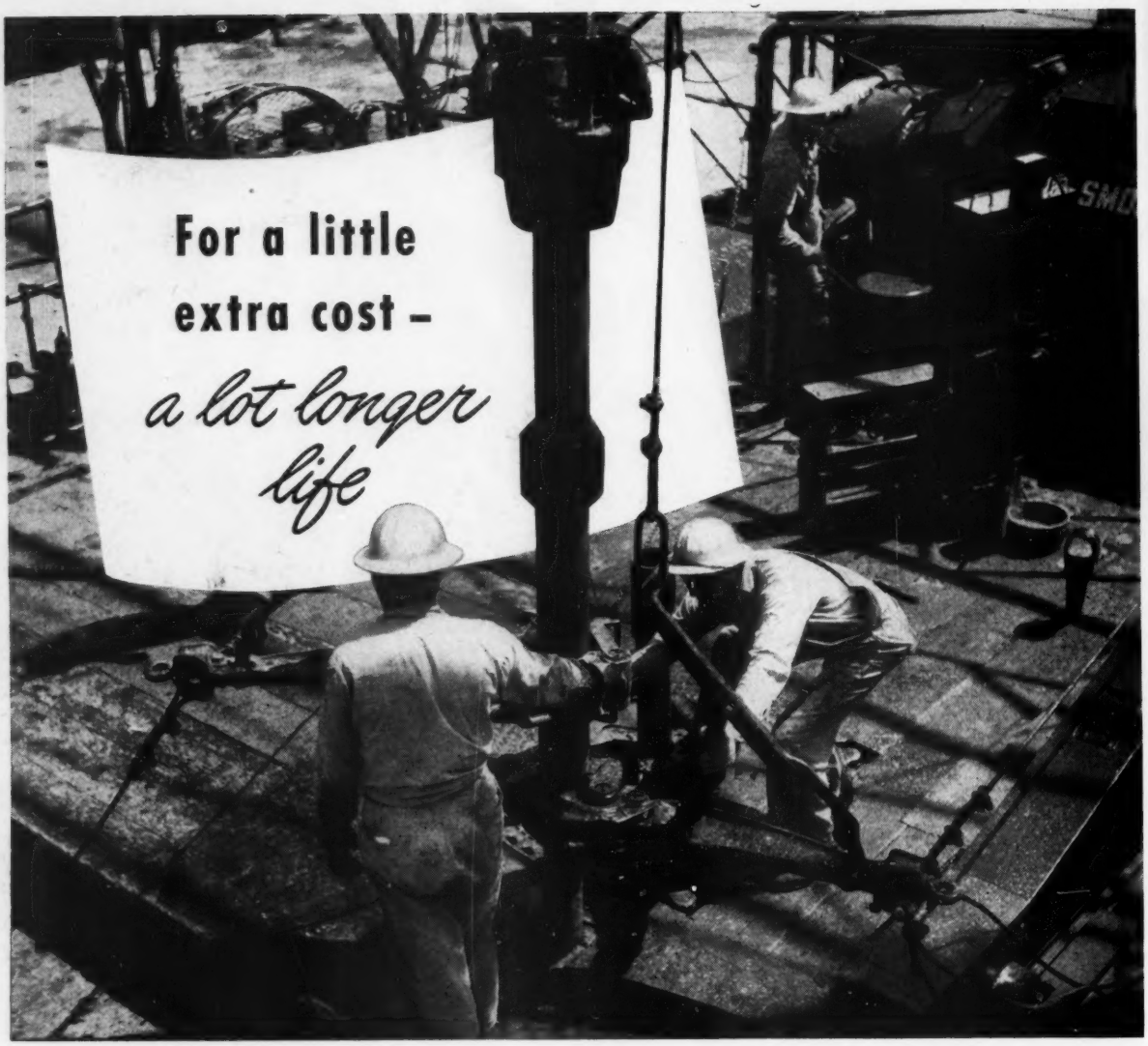

When you consider the tremendous investment in drilling equipment today, isn't it just good business practice to do everything possible to stretch its useful life?

Here's one way to do it—use Republic Alloy Steels for vital working parts subject to severe service.

For many years, these tough, strong, wear-resisting steels definitely have proved in oil country service that a little extra paid for steel means fewer repairs, lower maintenance costs, longer service life.

And Republic metallurgists are ready to show you how best to use alloy steels in drill bits, tool joints, subs, kellys, swivels, blocks, hooks and draw works parts. Write us.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL

Republic **ALLOY STEELS**

Other Republic Products include Casing—Tubing—Line Pipe—Upson Studs, Bolts, Nuts and Rivets—Electrunite Boiler Tubes

"No expense...in 20,000 miles...with FORD F-8 BIG JOB!"

Roadside Report

FORD Trucks

O. E. HELLING

PIPESTONE, MINNESOTA

"WE HAVE DRIVEN the FORD F-8 Big Job some 20,000 miles with no expense, except the regular servicing, such as changing oil, greasing, etc," reports Mr. O. E. Helling, Manager of the Hicks Oil Company. "This unit has traveled on gravel and blacktop in all parts of Minnesota, pulling a 5245-gallon gasoline tanker. Gasoline mileage has been 5.5 miles per gallon. We feel this is very good considering the load and road. We recommend the Ford F-8 Big Job to any operator who needs 'Big Power.'"

With Mr. Helling, as with thousands of other extra heavy duty truck users, the new Ford 145-horsepower Big Jobs are all the go! One reason why . . . engine power second to none in its class. Second reason . . . the luxury of the new Ford Million Dollar Cab. Third reason . . . Bonus Built construction, a feature of every one of over 139 Ford Truck models. Bonus Built is the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer!

ONLY THE FORD BIG JOB HAS ALL THESE FEATURES!

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions for operating flexibility.
- ★ Big Ford rear brakes for sure-footed stopping; 16-inch by 5-inch in the F-8.
- ★ Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Exclusive Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

FORD 1949 Bonus Built TRUCKS 1949

BUILT STRONGER TO LAST LONGER

USING LATEST REGISTRATION DATA ON 5,444,000 TRUCKS, LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

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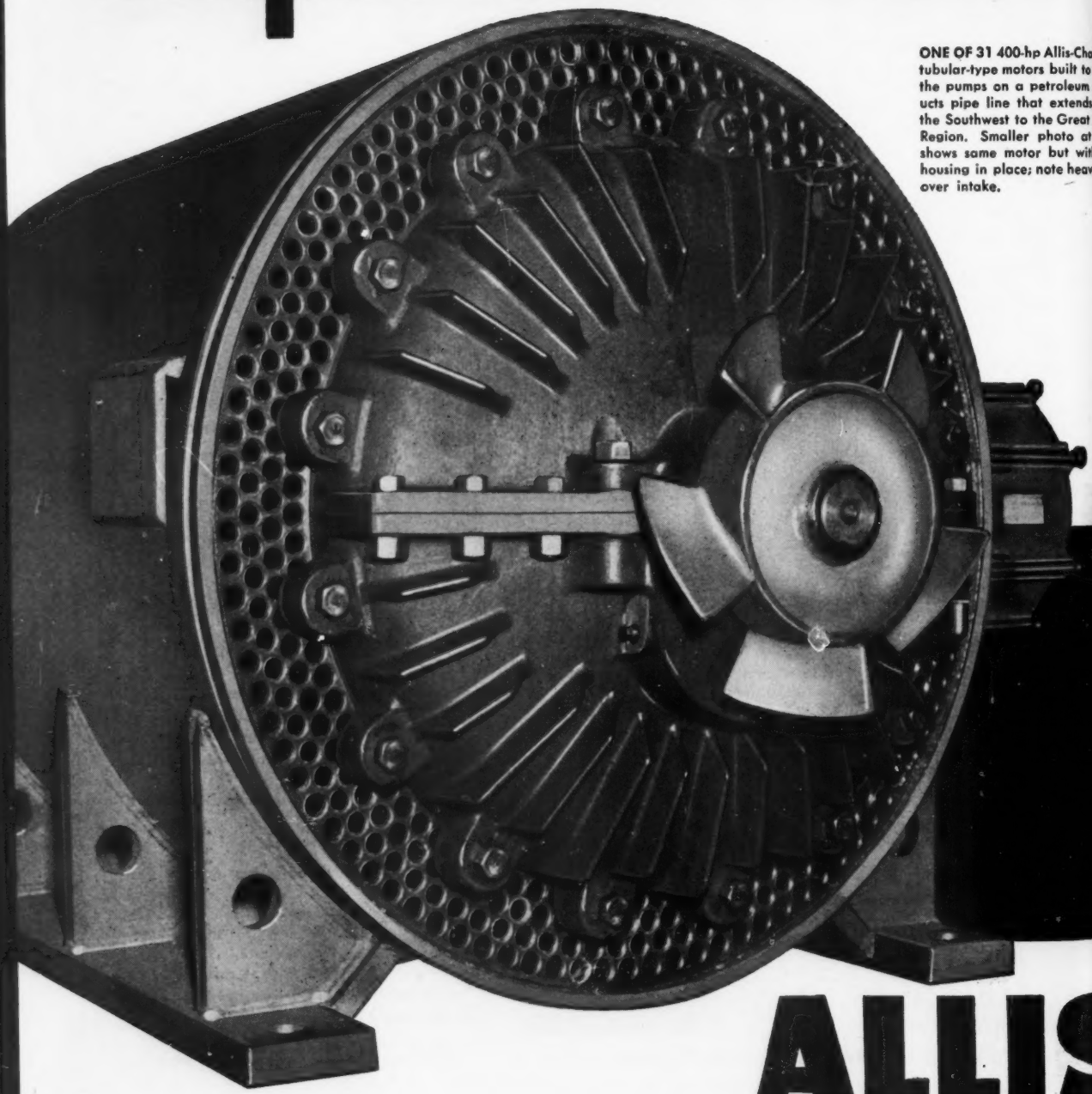
ANNOUNCE
Explosion-Proof



ONE OF 31 400-hp Allis-Chal
tubular-type motors built to d
the pumps on a petroleum p
ucts pipe line that extends
the Southwest to the Great L
Region. Smaller photo at
shows same motor but with
housing in place; note heavy
over intake.

ALLIS

Power, Electrical, Process

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New Tube-Cooled Motors!

IN RATINGS 150 TO 600 HP . . . FOR CLASS I, GROUP D AND CLASS II, GROUP G LOCATIONS

ALLIS-CHALMERS totally-enclosed, fan-cooled squirrel cage motors with Underwriters' *Explosion-Proof* labels for 1-D and 2-G locations are built in ratings of 250 to 400 hp at 3600 rpm . . . 200 to 300 hp at 1800 rpm . . . and 150 to 200 hp at 1200 rpm. Motors above and below these sizes are available in a similar design.

COOLING SYSTEM PROVED BY PERFORMANCE IN THE PAST

The system of cooling has been used for about three years by Allis-Chalmers on much larger totally-enclosed, fan-cooled motors. These larger ratings have been successfully used for many types of applications in power plants, chemical plants, pipe lines, and refineries . . . indoors and outdoors.

A nest of straight tubes in the circumference of the stator frame forms an air-to-air heat exchanger of high efficiency. The tube ends are tightly fitted into drilled steel plates at each end of the motor. The electrically active parts are fully protected from contact with outside air.

Internal fans continuously circulate the clean inside air around the nest of tubes, while a fan between the intake end cover and the end plate forces external air through the tubes and back into the atmosphere. Heat is transferred from the internal air to the atmospheric air by conduction through the tube walls.

For other features of this Allis-Chalmers tubular-type *Explosion-Proof* motor, see the outline below. For more information on the motor and its applications, call your nearby A-C office, or write direct for bulletins 05B7150 and 51R7149. A 2581

ALLIS-CHALMERS, 1059A SO. 70 ST.
MILWAUKEE, WIS.

These Features Mean Long, Dependable Drive Performance

1. COOLING SYSTEM is virtually self-cleaning. Forced air flow and straight tubes extending from front to rear prevent clogging — keeps system operating with high efficiency and reduces maintenance.

2. STURDY CONSTRUCTION assures long service and minimum maintenance. Special metals may be used where needed to meet corrosive atmospheric conditions.

3. RINGS WELDED into yoke are drilled to receive cooling tubes. Chamfering of holes in two end plates, expanding of tubes in holes, and flaring of tube ends produce joints which have met Underwriters' explosion tests. This construction keeps explosive mixtures out of motor and keeps the internal parts clean.

4. EXTERNAL FAN HOUSING is specially designed to assure proper flow of air to the tubes. Where sleeve bearings are used, a lucite cover permits inspection of the oil ring through the oil ring inspection plug with motor operating or idle. A strong grid covers the intake preventing accidental contact with the fan.

ALLIS-CHALMERS A-C MILWAUKEE

CHALMERS

and General Machinery for the Petroleum Industry

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All the Features Drillers WANT MOST in a Rotary!

BREWSTER HIGH-SPEED ROTARIES

MODEL RS-18

Featuring flame hardened spiral bevel ring and pinion gears.

MODEL RS-22

MODEL RR-27½

Brewster High Speed Rotaries have complete oilbath lubrication. Shock-absorbent, and slush-proof. Efficient and long life operation with correct bearing types of ample capacities. Write for complete information.

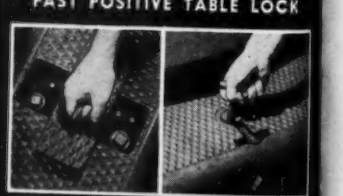
BREWSTER HIGH SPEED ROTARIES	RS-18	RS-22	RR-27½
Table Opening	18"	22"	27½"
Rated Deadload Capacity	167 tons	265 tons	513 tons
Recommended Drilling Depth (with 4½" pipe)	8,000'	12,000'	16,000'
Gear Ratio	3.53	3.03	3.67
Recommended Max. Table RPM	350	600	350
Oil Capacity, gallons	20	20	30

AMPLE BEARING CAPACITIES

HEAT TREATED GEARS

INTEGRAL BOX TYPE DESIGN

FAST POSITIVE TABLE LOCK



CONVENIENT LUBRICATION PANE

Sold by:
APEX EQUIPMENT CO.
BOYAIRD SUPPLY CO.
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MURRAY BROOKS, INC.
BEAMS SUPPLY CO.

In Canada: HALEY SUPPLY CO.

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420 Lexington Ave., New York 17, N. Y.

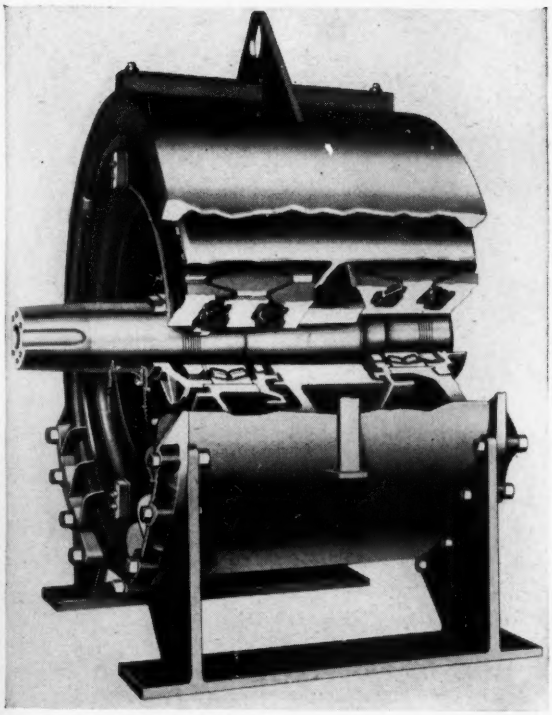
The BREWSTER CO., Inc.

Manufacturers of Drilling Equipment

Since 1910

SHREVEPORT, LOUISIANA U.S.A.

BREWSTER *Drilling Equipment*

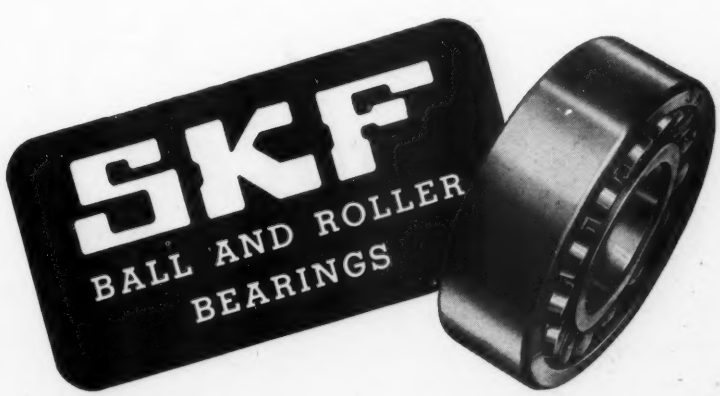


*Built by DYNAMATIC CORP., *subsidiary of Eaton Mfg. Co.*

High Capacity *plus* Rolling Alignment

Whenever an SKF Spherical Roller Bearing goes to work, there's assurance of high load-carrying capacity at all times. This is due to the number, size and shape of the rollers, and the accuracy with which they are guided. Because it has rolling alignment, angular misalignment between the shaft and housing has no detrimental effect. Its design and proportion enable it to carry heavy radial load, as well as thrust load, in either direction. These advantages can be added to the other advantages of *your* machines merely by using SKF Bearings. 6556

SKF INDUSTRIES, INC.
PHILADELPHIA 32, PA.



*Equipped with two SKF Spherical Roller Bearings, this Dynamatic Electro-Magnetic Drawworks Brake provides a retarding or braking effect which is variable and controllable through a range from 800 r.p.m. to a drum speed slow enough to set slips on the heaviest strings of drill pipe or casing without the assistance of the friction brake.

Call out the AUTOCARS when the going gets tough

Transporting drilling equipment calls for back-breaking loads, and on-highway as well as off-highway hauling. That kind of work calls for Autocar versatility . . . axle ratios that permit time-saving speeds when the road says "go," and the built-in stamina that withstands the roughest off-highway conditions.

Here's hauling equipment at work on a job for which it's pre-eminently suited. A giant Model DC-10064-S Autocar-Diesel moving a drilling rig. It's owned by J. C. Gauvey, oil field trucking contractor and general hauler, Eunice, New Mexico.

AUTOCAR TRUCKS

THEY COST LESS, BECAUSE THEY DO MORE WORK

MANUFACTURED IN ARDMORE, PA. • FACTORY BRANCHES AND DISTRIBUTORS FROM COAST TO COAST

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DIG *fast*... DIG *deep*... DIG *long*!

TUBE BORIUM

keeps ditcher teeth sharp, out-to-size, on the job

Keeping the teeth sharp on a ditch digger was quite a dental problem for one operator until he discovered Tube Borium. Now he reports 40 times longer service from a single hard-facing, and teeth are tipped a second and even a third time, with additional savings.

Drive sprockets and driving lugs on the bucket wheel are two other good bets for hard-facing. Simply weld a few ounces of Stoody Self-Hardening to the pressure faces. It quickly restores tooth size and shape and generally doubles service life over similar unprotected parts.

Remember, there's a Stoody Alloy for any wear problem involving abrasion, even when combined with impact, corrosion or heat.

APPLICATION
Both new and worn Ditcher Teeth can be hard-faced but worn teeth should first be sharpened by reforging. Hard-face tooth faces 3/4" up from cutting edge with 3/16" 20-30 mesh Acetylene Tube Borium. 1 lb. of hard-metal covers 25 small teeth.

STOODY COMPANY
1138 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

Check KOEHRING HEAVY-DUTY on CRAWLERS or RUBBER

Whether your oil field operating conditions demand sure-footed crawler traction to lick toughest mud and grades . . . or require speed and mobility of rubber tires to cut travel time between widely-scattered jobs . . . you'll find the lowest-cost answer in Koehring's full line of crawler-mounted and rubber-tired excavators and cranes.

Both the heavy-duty ¾-yard 304 and Koehring ½-yard 205 give you shovel, pull shovel, dragline, clamshell and lift crane service on crawlers, truck or cruiser mounting. As heavy-duty crane, the 304 handles up to 20 tons . . . the 205 lifts up to 10 tons, depending on type of mounting. Other Koehring sizes: 1½-yard 605 and big 2½-yard 1005 . . . both are crawler-mounted, for your biggest oil field jobs.

There's a Koehring size and type best suited for *you* . . . you'll find your local Koehring distributor ready to analyze your requirements and make recommendations to your best interest. See him soon.

KOEHRING COMPANY
Milwaukee 10, Wis.
SUBSIDIARIES: KWIK-MIX • PARSONS • JOHNSON

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. . . for fast oil field service . . . . . .

NOW! 18.5 m.p.h. TRENCHMOBILE on rubber

Now it's trench diggers on rubber or crawlers! In addition to the Parsons line of 4 big crawler-type Trenchliners* for main line excavations, you can now get a small, fast, utility-size Trenchmobile for extra speed and lower costs on lateral trenches, small pipeline excavations, etc.

This mobile, rubber-tired Model 80 gets around at 18.5 m.p.h. . . . goes anywhere, cross country or down the highway, under its own power. No waiting for truck or trailer. You just drive it away . . . travel a mile in less than 4 minutes!

One-man Trenchmobile cuts trenches 5" or 7½" wide . . . up to 4 ft. deep . . . has 4 digging speeds from 2.16 to 13.22 ft. per minute. Makes smooth-walled trenches in toughest digging . . . crumber attachment assures clean trench bottom. Get all the facts from your local Parsons distributor . . . or mail coupon *TODAY*.

*Trademark Reg. U. S. Pat. Off. KP921

PARSONS
COMPANY Newton, Iowa
KOEHRING • SUBSIDIARY

to: The PARSONS Company, Newton, Iowa

Send us complete information on Model 80 Trenchmobile.

NAME.....
TITLE.....
COMPANY.....
STREET.....
CITY.....STATE.....

Also send bulletins on big, crawler-type Trenchliner* models:

☐ 200 ☐ 221 ☐ 250 ☐ 310

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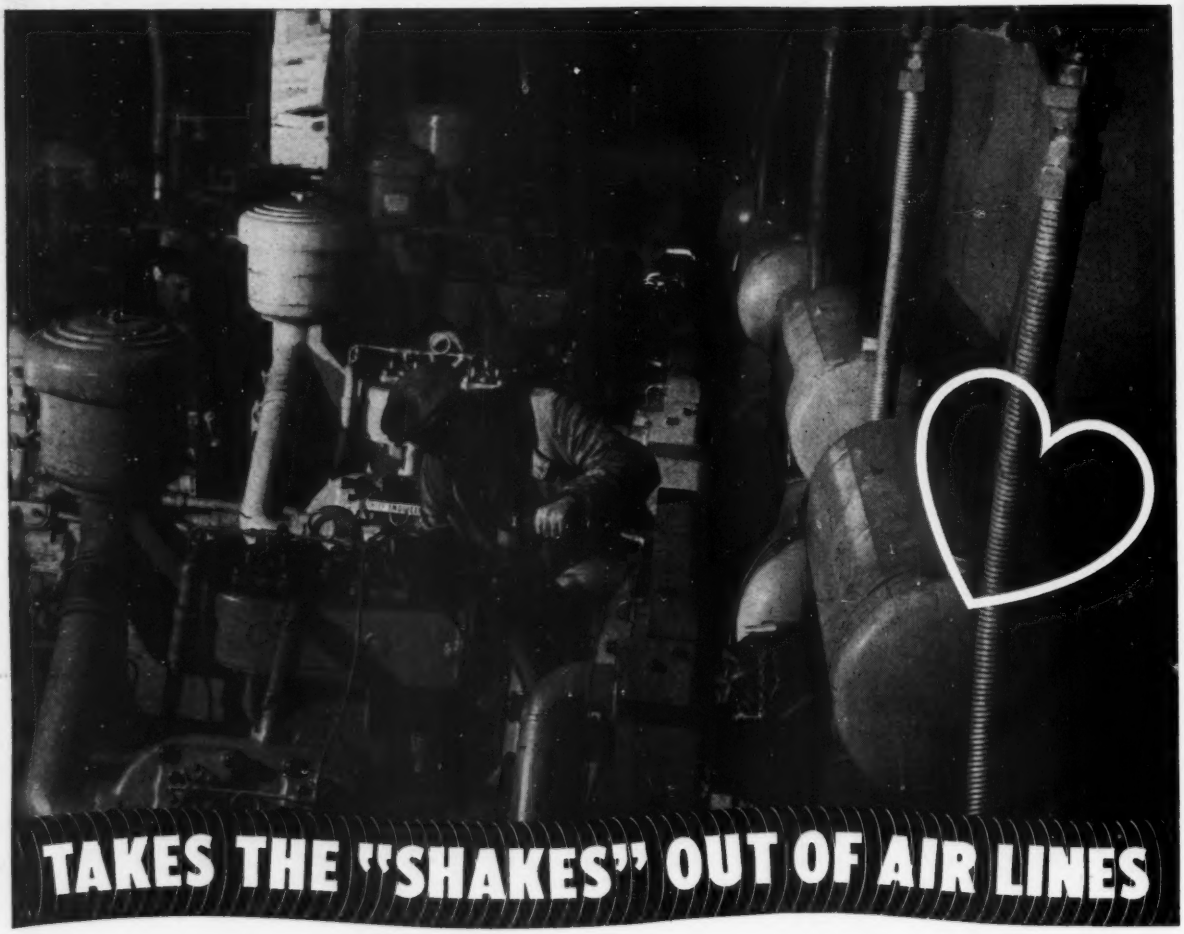

TAKES THE "SHAKES" OUT OF AIR LINES

Penflex Flexible Metallic Hose prevents vibrations on compressed air lines, easily... safely... economically

With a mighty roar, 15 diesel-powered air compressors pump a steady air supply for air tools and equipment used on a world-known project. During the installation of these powerful compressor units, a method was required to prevent constant vibration from being transmitted to the rigid air lines.

That's where Penflex "Flexineering" service paid off. By using 3" Penflex interlocked flexible metal hose as connectors between compressors and pipe lines, the "shakes" are eliminated. Tight as a pipe, but flexible, Penflex hose "soaks up" constant vibration, assuring smooth air power . . . leak-proof, low-cost service. Penflex hose is also used to carry off obnoxious diesel exhaust, preventing dangerous leaks and vibration.

When your plant is troubled with flexible tubing problems, whether they pertain to production, maintenance or high operating costs, let Penflex "Flexineering" find the right answer. As America's oldest manufacturer of flexible hose, Penflex offers helpful layout-design service on flexible tubing applications to all industries. For flexible metallic hose, tubing, or couplings from 1/8" I.D. and up . . . for handy, time-saving automatic barrel fillers and pneumatic rivet passers . . . for the finest in engineering service, call on Penflex. Write today, to . . .

PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY

7213 Powers Lane **Philadelphia 42, Pa.**

BRANCH SALES OFFICES—BOSTON • NEW YORK • CLEVELAND • CHICAGO • HOUSTON • LOS ANGELES

Penflex... HEART OF INDUSTRY'S LIFE LINES

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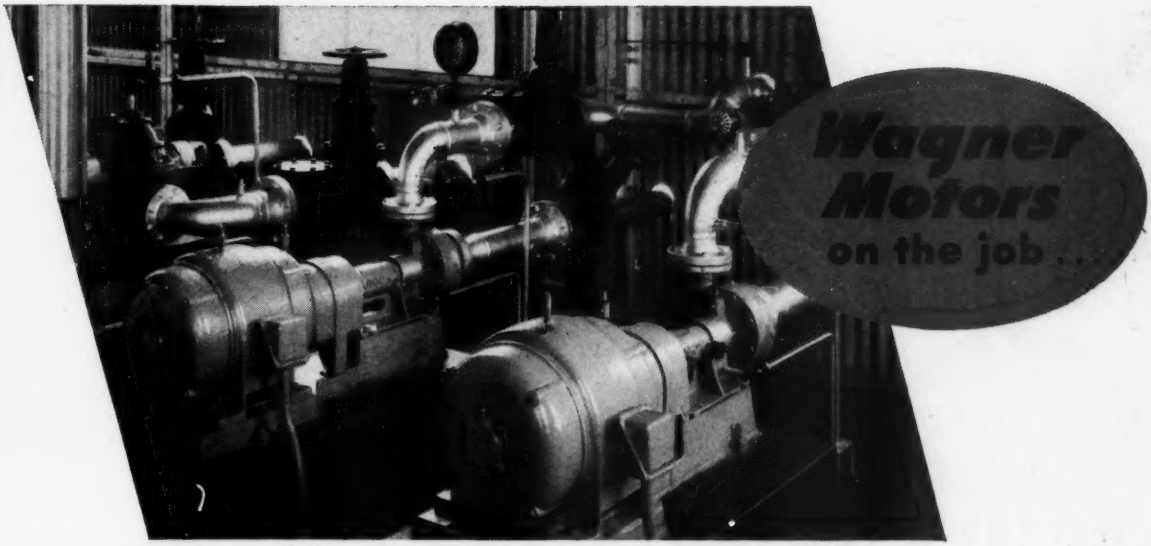

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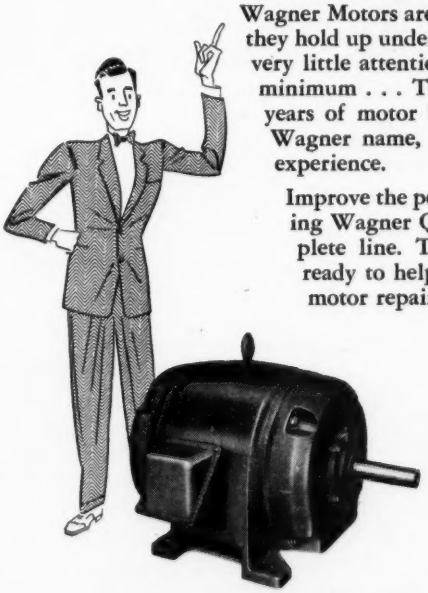

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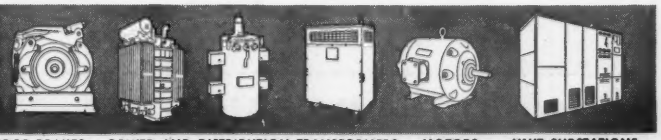

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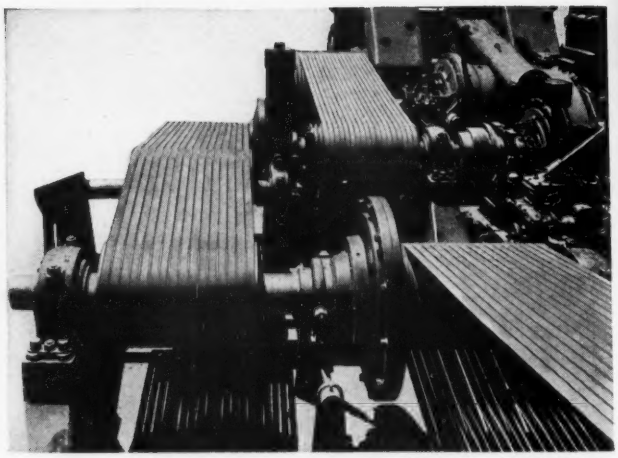

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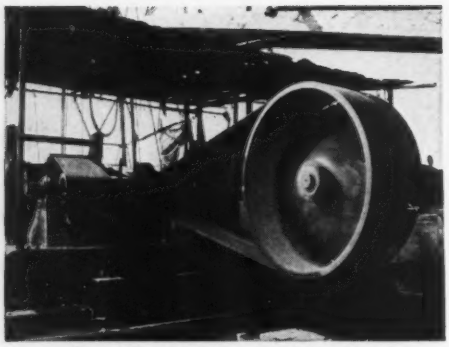
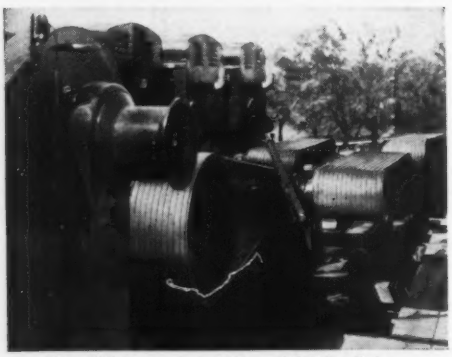


Gilmer V-Belts on drilling rig in oil field service.



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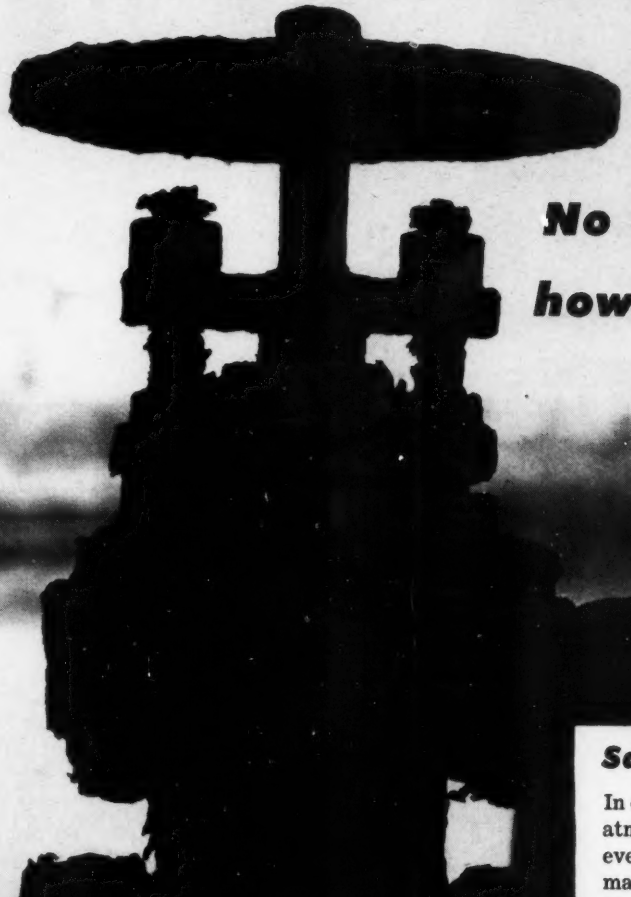

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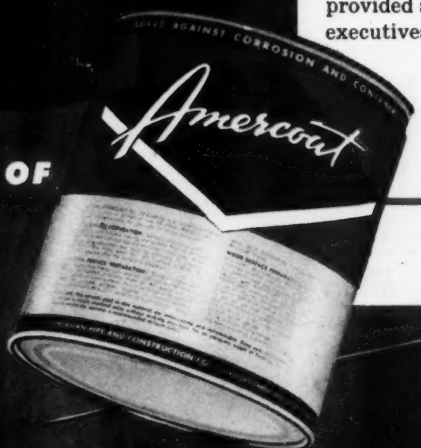

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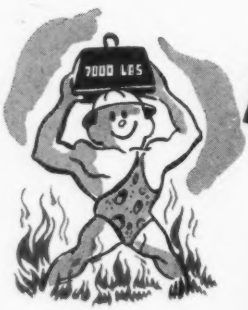

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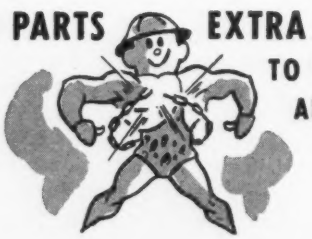

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JOURNALLY Speaking

Plenty of U

DAVID E. LILIENTHAL, chairman of the U. S. Atomic Enery Commission, is burned up because some prophets of doom already are croaking: "We're running out of uranium." And with the atomic energy business just barely getting under way.

Oil men can sympathize with him because they are used to having Ickes and his ilk wail "we're running out of oil" when year after year they have gone out and dug up more where the dismal dirgers said there wasn't any. In fact, Dave is taking a leaf from oil's history and cites the consistently wrong predictions of an oil shortage as pretty good proof that plenty of uranium will be found if it is worth men's while to look for it. He has sound geological backing, also, for his own prediction that when the country really gets to using atomic energy on a commercial basis there will be plenty of uranium to feed its piles.

It was this same Dave Lilienthal, incidentally, who said his job as director of TVA was "to make two bulbs of glass glow where only one glew before." That's the old optimistic spirit that made the oil industry what it is.

Lilienthal also finds another link between oil and uranium: The AEC has discovered that oil shales contain small amounts of this ore, and is studying the feasibility of its commercial extraction. Perhaps the Bureau of Mines can put its pet project on its feet by producing uranium as a byproduct of shale oil, or vice versa.

Old Barnsdall

A RECENT news item in our favorite oil publication referred to Barnsdall Oil Co. as one of the oldest trade names in the industry.

A modicum of historical research reveals that a Barnsdall well was drilled shortly after Drake's during the first oil boom in American history. If this really was the start of Barnsdall Oil Co., and we admit having made no effort to find out, then that company would seem to have an unquestioned claim to being the oldest oil company in the world continuously operating under its original name.

Does any historically minded oil man care to challenge, corroborate, or amplify that?

The Texas Way

A LOT of the amendments now in our Constitution were put there as a result of some decision by the Supreme Court, but the amendment Texas proposes on tidelands is the first one ever to come right out flat and say the Supreme Court is repudiated. Texans do everything in a big way.

Cherokee Lesson

OUR text for today is taken from the Daily Oklahoman, which quotes from a forthcoming book by Prof. Carl Coke Rister, who dug it out of some old records while doing historical research under a grant to the University of Oklahoma from Standard Oil Co. (N.J.).

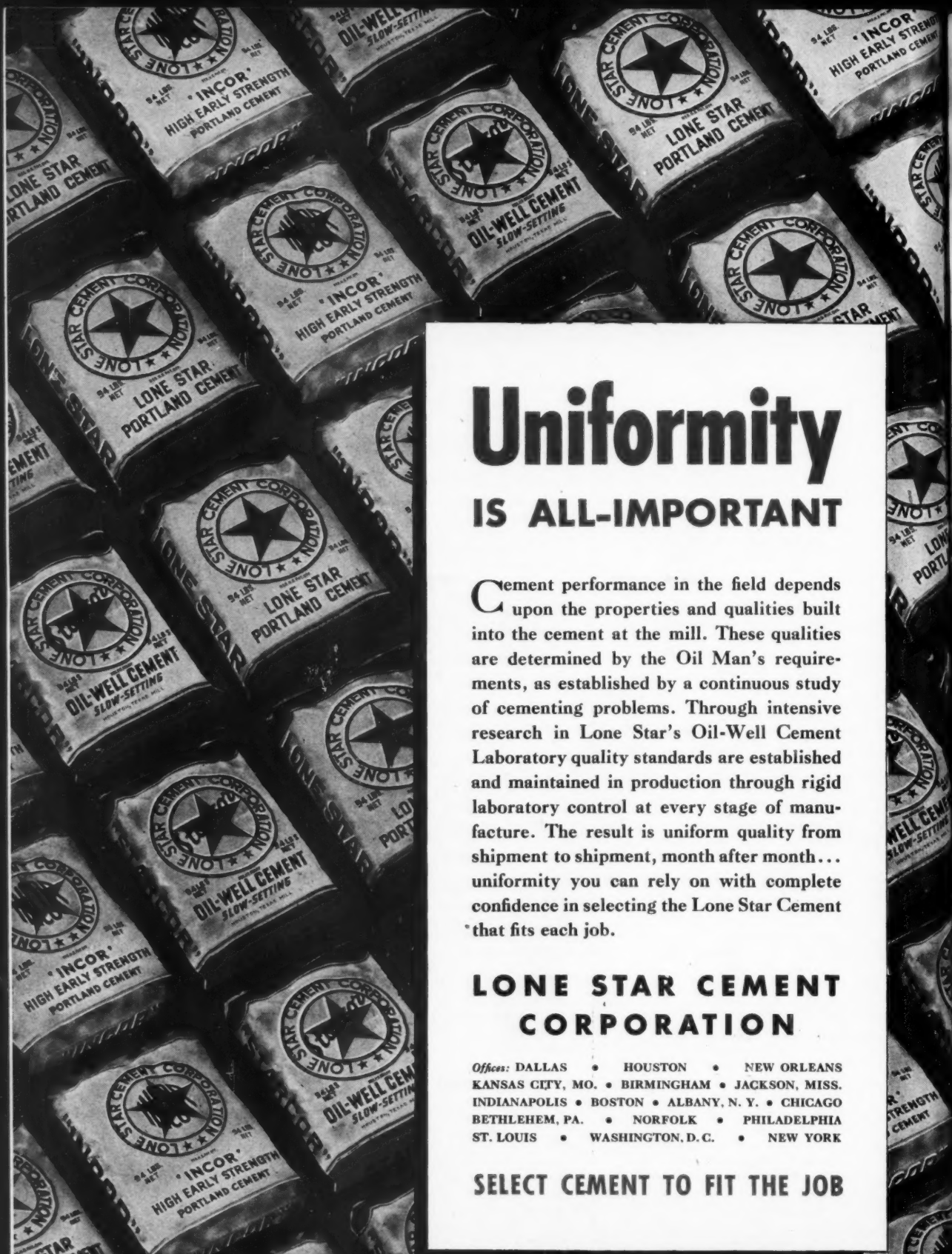
In the summer of 1859, which was several months before Colonel Drake completed his much-publicized well, a Cherokee Indian drilled an oil well in eastern Oklahoma which produced 10 bbl. per day for a year. The Indian sold the oil for cattle dip and axle grease. This should make it the world's first commercial oil well.

From this bit of historical lore we draw the following lessons:

1. The Cherokees didn't know the value of advertising and promotion but Yankee Drake did so he gets the credit for being the grandaddy of the oil industry.

2. The federal Government, which was running Indian Territory at that time, was no more successful in finding and developing oil than any government any place any time since—and you can draw your own conclusions as to how hot an oil man Uncle Sam would make now.

3. If The Oil and Gas Journal had been published in 1859 it would have carried a full report on "Cherokee No. 1" and Jersey Standard wouldn't have to add petroleum archeology to the other ologies on its string.



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Financing Foreign Oil

EXPANSION of American investment abroad was proposed by President Truman in his inaugural address when he called for a "bold new program" of assisting underdeveloped areas of the world with capital investments and technological knowledge.

Several foreign governments interpreted this as meaning that American loans would be forthcoming immediately. Oil producers in the United States are wondering whether the intention is to make government loans for further development of foreign petroleum resources.

Details of the program are still vague. If its draftsmen fall under the influence of a certain group in Washington we will be presented with a duplicate European Recovery Program for the rest of the world. It is doubtful that the American taxpayers could shoulder such or that it would result in much actual development of foreign oil.

The administration would do well in following the suggestions for foreign development outlined in the policy statement of the National Petroleum Council. This calls for diplomatic measures to persuade foreign governments to make it reasonably safe and attractive for private capital to invest in economic enterprises abroad, plus safeguards against what the President calls "imperialism—exploitation for foreign profit."

Apparently it is also planned to enlarge and expedite the functioning of the World Bank and other agencies of the United Nations to foster world economic development projects of the type generally outside the sphere of private capital.

With such a pattern the "bold new program" would draw a clear and proper distinction between the spheres of private and government lending and operating.

If the program works out this way there should be little apprehension that this Government will go into the foreign oil business. It has been well demonstrated, both here and abroad, that of all forms of economic enterprise the development of petroleum is least suited to government operation.

On the other hand, it would not appear that the Truman program will have rapid results in opening foreign doors to large private investments for oil development. The obstacles to investment in many countries are so great and so firmly held that it will take much negotiation to overcome them.

But American capital abroad, outstandingly oil capital, has behaved itself well in recent years, and if our Government can convince other countries that our investors seek only fair treatment and will give it in return, the program could be of great assistance in a gradual and orderly development of the petroleum resources of other areas with the loan of American funds and technology.

Big Reduction in Crude Imports From Middle East Is Scheduled

by Dahl M. Duff

NEW YORK.—Imports of crude oil from the Middle East will be substantially reduced during the coming months as a result of the improved supply of domestic oils.

Standard Oil Co. (N.J.) is cutting back sharply on its imports from the Persian Gulf area, and reports in New York are that some of the other importing companies also are programing a reduction in crude from that area.

A Jersey Standard official said the Middle East imports simply represented the company's marginal supply which is necessary only to the extent that the oil is not available in the United States. He said tentative plans are for much lower imports, although the schedules are subject to almost daily revision.

Interest in Middle East oil for importation into the United States has waned considerably in the last few months, according to an official of another company operating in the area. He pointed out the price laid down in New York is generally higher than domestic oil.

Unofficial reports in New York were that Jersey Standard is reducing its current Middle East imports by 50 per cent and that by the end of the year they will be down to 10 per cent of the 100,000-bbl. daily peak the company reached late in 1948. The Jersey company accounts for about two-thirds of the Middle East imports.

Other companies importing Middle East crude include Gulf Oil Corp., Socony-Vacuum Oil Co., Inc., The Texas Co., and Tide Water Associated Oil Co. Gulf and Texaco are planning new refining facilities at Philadelphia which are designed to use foreign crudes.

The prospective drop in Middle East crude imports is another result of the end of the postwar oil shortage in the United States. In the case of the Jersey Standard, the Middle East imports increased to about 128,000 bbl. daily in the fourth quarter.

Major part of United States crude imports continues to come from South America, and with the economic advantage of a relatively short freight haul as against 8,000 miles for the Middle East shipments these imports are expected to continue with little change in 1949, insofar as crude oil is concerned.

Kansas, Oklahoma Crude Allowable Cut, Louisiana Production Raised

FEBRUARY crude-oil production is expected to show a substantial reduction, reflecting cuts in allowables initiated by principal oil-producing states.

Oklahoma and Kansas have announced reductions in their state crude proration orders following the lead of Texas. Meanwhile, Louisiana's oil production allowable for February has been set at an all-time high.

The Oklahoma Corporation Commission has set allowable production for February at 411,150 bbl. daily, 32,350 bbl. below the January allowable of 443,500 bbl. The commission, in announcing the allowable, said that further curtailment was likely "on account of the abnormal supply of oil above ground which has been caused indirectly by the importation of excessive amounts of crude from foreign countries."

The Kansas Corporation Commission set allowable production in February for that state at 290,000 bbl. daily, a reduction of 5,000 bbl. daily from the January allowable. Actual production in Kansas during January ran about 292,300 bbl. a day while purchasers' nominations for February crude from the state totaled 371,515 bbl. a day, 1,500 a day higher than January requests.

At the same time other states are cutting back their allowables, Louisiana's oil production allowable for February was set at 553,975 bbl. a day, 2,405 bbl. above December allowable. The December daily allowable for Louisiana was 551,570 bbl. as compared to 507,992 bbl. a year ago. By districts, the new allowables for Louisiana are: Houma, 84,141; Lafayette, 147,881; Lake Charles, 65,416; New Orleans, 120,967; Monroe, 85,622; and Shreveport, 49,948 bbl.

Action of the four large oil-producing states, including Texas, represents an over-all cut of some 100,000 bbl. daily in February.

In Oklahoma City, the state Corporation Commission, as the result of the sharp curtailment, passed a resolution requesting the congressional delegates of Oklahoma to bring to the attention of the federal Congress the opinion of the commission, "that the importation of oil from foreign countries to the United States should be curtailed." Gov. Roy J. Turner of Oklahoma also voiced his agreement with the action. Belief was expressed by the commission that foreign imports of petroleum should be limited to a supplemented basis, and as needed. The unlimited importation of foreign oil, it said, is a threat to the domestic oil industry.

Walker T. Pound, director of conservation to the commission, had previously reported that the Bureau of Mines showed imports had more than doubled over the 1947 figures and that exports were down.

Texas Cuts February Allowable Second Time

HOUSTON. — Revision of proration schedules has cut Texas' February crude-oil alowable down another 6,701 bbl. The Railroad Commission last week announced a reduction of 66,188 bbl.

The two cuts bring the state's daily allowable production for the month to 2,435,343 bbl. which is down 274,958 bbl. from December's all-time high. The latest slash was accomplished primarily in East Texas fields producing heavy crudes. Market demand for such crudes has been particularly poor the past few months.

Newly announced allowables include: Como field, 828 bbl., and Mitchell Creek field, 186, both in Hopkins County; Alba 175, Coke 1,647, Coke (sub-Clarksville) 1,647, Manziel (sub-Clarksville) 289, and Yantis 921, all Wood County; and Bartless field, Jones County,2,100. Talco field, Franklin and Titus counties, will be shut down 5 days in February. Heretofore the fields have operated without shutdown. Joe's Lake field, Tyler County, received an allowable increase of 900 bbl. in line with a request made by operators at last week's statewide hearing.

Three fields, as follows, were exempted because of reservoir conditions: Green Branch, McMullen County; Fig Ridge, Chambers County, and South Houston, Harris County.

In another commission order, 12 Panhandle field gas wells were exempt from the proration order following a request by Secretary of Defense James Forrestal. The wells produce natural gas with a high helium content which is processed in the Government's Exell helium plant.

Texas House Members Propose Tax Bills to Replace Import Revenue

by Leigh S. McCaslin, Jr.

HOUSTON.—A highlight of the past week in the Texas Legislature, as far as the oil industry is concerned, was the introduction of a resolution asking Congress to take action to reduce oil imports.

Sen. Jimmy Phillips of Angleton attempted to have his resolution passed immediately, but was overruled and it was sent to the committee on oil and gas. In behalf of his resolution, Phillips told the Senate that foreign imports have forced Texas production down until the state government's loss of tax revenue for the year 1949 will be nearly $14,000,000, or around $40,000,000 if the gasoline tax is considered.

In elaborating, Phillips said that "the Railroad Commission has cut the allowable of wells 15 per cent below their maximum efficiency. This has resulted in a production loss of 250,000 bbl. a day and a loss of $1,143,745 to the state treasury monthly.

"A Dangerous Condition"

Although Phillips called the present situation a "most dangerous condition affecting the people of Texas," the Senate voted 25 to 5 to refer the resolution to the oil and gas committee.

The Texas House of Representatives is still being organized and no bills have been introduced. Members are holding their bills until committees are appointed by Speaker Durwood Manford. However two members of the house have promised to introduce, as soon as possible, bills which would collect millions with a natural-gas tax.

Rep. C. S. McClellan has a plan to tax natural gas at a rate of probably 1 cent per 1,000 cu. ft. He has not announced whether this will be in the form of a gathering tax or a production tax at the wellhead. Estimated income from such a tax would be from $32,000,000 to $34,000,000 annually, with three-fourths of the total going for rural roads and one-fourth to the public school fund.

The present state tax on natural gas brought in an estimated $8,500,000 this year. This is collected in the form of a receipts tax of 5.2 per cent of the market value of gas sold to consumers.

McClellan sponsored a similar bill in the last session of the legislature. In discussing the present bill, he has been reported to have said, "what we'd like to do, of course, is place a tax on the gas being exported. We can't do that for constitutional reasons, so our alternative is a tax on everything to replace the income that now is pitifully small."

The second proposed natural-gas tax is being sponsored by Rep. Deno Tufares of Wichita Falls. Tufares will ask for a tax of 1½ cents per 1,000 cu. ft. of gas at the wellhead. The estimated $42,000,000, which would be collected annually from such a tax, would be split among charitable institutions, rural schools, and rural roads.

Both house members have stated that gas used for secondary-recovery purposes would be exempt from the tax.

In the senate, a bill has been introduced by Sen. Keith Kelly of Fort Worth calling for taxes on co-ops equal to those imposed on private business. The bill is designed to cover "every cooperative or fraternal association or corporation authorized to do any business of any kind or nature whatsoever in Texas." It calls for the same taxes and license fees "as any other association or corporation, either domestic or foreign, engaged in doing the same or similar business."

Debate on the unitization bill introduced early in the session by George Moffett of Chillicothe continued during the week. E. I. Thompson, executive vice president of the Texas Independent Producers and Royalty Owners Association, made public five objections to the bill by his group. They were:

1. The bill establishes a different rule of property in Texas by abolishing the law of capture and substituting acreage proration in its place.

2. There is no minimum-acreage requirement and as few as two persons could obtain a commission finding that unitization is necessary and thereby set the pattern for all future development of a field, and ultimately force all other operators into their unit.

3. The bill would eliminate the antitrust laws insofar as trusts and combines for marketing byproducts of gas are concerned.

4. The royalty owner is in no way protected or considered.

5. In the administration of the unitization program, the bill provides a specific exemption from the jurisdiction of the Texas antitrust laws.

Aerial Magnetic Survey To Begin Soon in Ontario

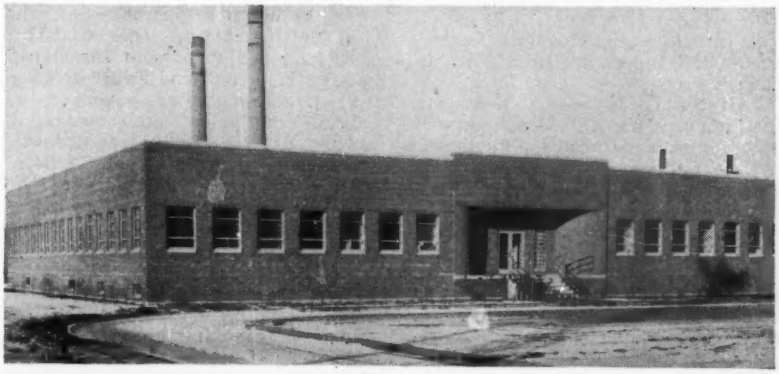
Aero Service Corp., Philadelphia, is commencing this month the first flights of a 1,200-sq. mile airborne magnetometer survey for the Province of Ontario, Canada.

The survey, to be completed in about 6 weeks, will extend aerial magnetic studies already performed in Ontaria by the Canadian Geological Survey.

Conservation Law Approved

HOUSTON.—Approval of Louisiana's present conservation law was expressed last week by representatives of major oil companies meeting in Baton Rouge with a legislative committee investigating the law.

NEW LABORATORY FOR CITIES SERVICE



Cities Service Oil Co.'s recently completed new technical service laboratory at the East Chicago, Ind., refinery where service testing and product evaluation will be carried out. The laboratory will conduct special investigations such as corrosion control, waste disposal, chemical treatment, and general processing improvements. H. W. Camp, manager, manufacturing division, will direct operations

Egloff Praises Oil's Research At Carter Laboratory Opening

THE oil industry is so much the leader in industrial research that it spends 25 per cent of the $450,000,000 spent annually in this country for private industrial research, Dr. Gustav Egloff of Universal Oil Products Co. declared in an address at the dedication of the new research laboratory of Carter Oil Co. in Tulsa January 28.

The new laboratory, which Dr. Egloff described as typical of the research work being done throughout the industry, was opened to the inspection of a large party of invited guests, including members of the faculties of engineering schools and officers of trade and professional associations in the oil industry.

The laboratory will operate primarily on basic research problems concerned with exploration, production, and reservoir behavior, and will serve all affiliates of Standard Oil Co. (N.J.). In an introduction to the inspection tour E. V. Murphree, president of Standard Oil Development Co., said that this laboratory is part of the $28,000,000 research budget of the Jersey Standard group, and explained that one of the objectives is to correct the deficiency in the study of geology which for many years concentrated on mineralogy and neglected sedimentary geology.

Visitors saw experiments in progress on such problems as improved geophysical methods and equipment, new drill bits and drilling muds, methods of determining the permeability and porosity of rocks, and instruments for analyzing the behavior of an oil pool to determine well spacing and rate of production.

Research Has Flourished

In his address on "Modern Research in the Oil Industry," Dr. Egloff declared:

"All through its years of growth, the industry has functioned on private funds, and has been motivated by the dynamic force of the profit incentive. A healthy research climate has resulted therefrom. Today the industry is even more research-minded as the uses of petroleum products multiply in volume and number. This trend has resulted in the installation of new research laboratories employing thousands of chemists, physicists, engineers, and geologists.

"Besides supporting fundamental research in their own laboratories, oil companies are financing fellowships and researches at universities and foundations. Great progress has been made in studying the origin of petroleum, and research in production, transportation, and refining is bringing rapid developments in these departments of the oil business.

"Amazing progress has been made in developing new methods for locating oil. However, despite all the science we can apply, only one out of every five wildcat wells drilled is a producer of oil or gas. Much more research is needed to increase the percentage of producing wells.

"Research has done much to improve the efficiency of drilling. The drill can now be guided so there is less than a 2-degree deviation from the vertical at a depth of over 2 miles, or it can be turned at will to tap several oil-bearing strata.

Mud Replaces Water

"In the past, water was used to carry ground rock particles out of the drill hole, but now carefully compounded chemicals called drilling muds are a science in themselves. At the high pressures of deep wells colloidal drilling fluids of high density are used as a counterweight to prevent blowouts.

"Wells have been sealed against water for many years by hydraulic cements. Research is now in progress using special plastics which keep out water, and others which coat drill pipe and casings to prevent corrosion.

"Research has shown ways of getting more oil from the rocks and sands in which it occurs. Vast quantities of oil are being found under lakes and seas. This marine exploration has involved completely new techniques such as drilling from platforms supported on piling in 60 ft. of water, 25 to 30 miles from shore.

"Oil producers operating in the Gulf of Mexico and the ocean off California are at present threatened because of a Supreme Court decision that offshore rights are vested in the federal Government. Such ownership has never promoted the rapid development of oil reserves, and federal encroachment on the rights of the states would retard needed oil production. The Eighty-first Congress should return title to the states by legislation.

"One of the greatest conservation forces in the oil industry was the invention of cracking processes which have made unnecessary production of 28 billion barrels of petroleum by increasing the yield of gasoline from every barrel of crude. In 1948 alone a saving of 2½ billion barrels resulted from its use. In addition, the gasoline bill of the motorist was cut a billion dollars because of greater mileage and better performance of his car. Motor fuels are in the making which will markedly increase present gasoline mileage when used in automobile engines now being developed.

"The oil industry is predominantly a chemical one, and has produced a host of new products as one of the major functions of intensified research. The possibilities in this field are enormous, and petroleum is now a strong competitor with coal tar for the manufacture of many compounds. In addition, petroleum furnishes new types of materials not obtainable from coal tar. There are over a half million different organic chemicals, and petroleum can be a source for all of them.

"Alcohol is produced from cracked gases at the rate of a hundred million gallons a year, which conserves large quantities of grain and sugar sorely needed for food. The oil industry could produce all the alcohol that the world could use. For over a century and a half, the world's supply of glycerin has come from edible fats. Recently a commercial plant to produce glycerin from petroleum at the rate of thirty million pounds a year has gone into operation.

"The oil industry is aware of the fact that petroleum may, in the distant future, be inadequate to meet requirements. In anticipation of future needs, it has spent millions of dollars in research on processes for making oil from natural gas, coal, and oil shale.

"Our legislators in the Congress are proposing government-subsidized plants of commercial proportions for making liquid fuels from coal and oil shale. The industry is in agreement with having the Government carry out fundamental researches, but believes that commercial development should progress in an orderly manner. The construction of commercial units should be delayed until the fundamental research has been completed and an economic study shows that such plants would be profitable. Either building government-owned plants or forcing industry into building commercial plants without a thorough study of the whole problem is not justified. As the demands for oil increase, the industry will find ways to meet them, as it always has."

Louisiana Leases Fourteen Tracts

HOUSTON.—Fourteen state-owned tracts have been leased by the Louisiana Mineral Board for a total of $196,051 in bonuses.

No offshore tracts were included in the lease sale. Very little interest has been expressed by oil operators in such leases since the United States attorney general filed suit against Louisiana for possession.

this week

IMPORTS—Several major companies promise to curtail Middle East imports. . . . ¶I.P.A.A. demands action to reduce flow of foreign crude. . . . Opposes continuation of reciprocal trade program. . . . ¶Texas Legislature denounces oil imports. . . . ¶Oklahoma commission blames imports for domestic cutback. . . .

PRODUCTION—Texas, Oklahoma, and Kansas reduce allowables. . . . Louisiana increases. . . . ¶Campaign to reduce waste of flare gas in Texas shows progress. . . . ¶Rising stocks of fuel oils pose problems for refiners and marketers. . . .

WASHINGTON—Secretary Krug says oil problems not yet solved. . . . Wants Government to take lead in setting policies. . . . ¶Small business committee says big oil companies are monopolistic. . . . Blames them for oil shortage, abuse of conservation, troubles of independents, and many other ills. . . . ¶Bill advanced to extend steel allocation programs. . . . ¶Court clips FPC authority over natural-gas production in Panhandle case. . . .

TRENDS—Average daily crude-oil production for U. S. for week ended January 29 was 5,426,750 bbl., a decline of 1,840 bbl. from previous week. . . . ¶Total aboveground oil stocks at the turn of the year represented 90 days' supply, an increase of 10 days' supply over previous year. . . . Reflecting the high increase in refinery runs, products stocks accounted for nearly all the gain. . . . At the beginning of last year, days' supply of total stocks were lowest in past decade. . . . At the end of 1938 supply was estimated at 151 days. . . . ¶Stock level of four major products for week ended January 24 was down 379,000 bbl. . . . Greatest decline in distillate oils, showing drop of 1,745,000 bbl. . . . A firm increase of 2,368,000 bbl. in gasoline stocks was seen. . . . ¶Stock levels of petroleum products suppliers continue high. . . . Spotty low temperatures over nation fail to substantially bolster relatively weakened markets. . . . One-cent cut in natural-gasoline price is noted. . . . ¶Creole cuts price of heavy crude in Venezuela for second time in past 2 weeks. . . .

PIPE LINES—Construction of Chile's Tierra del Fuego crude-oil line scheduled for late this month. . . . ¶Buckeye Pipe Line Co. is having pipe coated to lay 82-mile, 22-in. crude-oil line from Lima to Toledo, Ohio. . . . ¶Thirty miles of Atlantic's 382-mile, 8-in. Refugio-Crane, Tex., crude-oil line has been laid. . . . ¶Lion Oil Co. extends system for moving oil to its El Dorado, Ark., refinery. . . . ¶Clendenin, W. Va.-Rockville, Md., 26-in., 268-mile natural-gas line is approved by FPC. . . . ¶Pacific Gas & Electric Co. gets approval of state Public Utilities Commission for 506-mile line across California. . . .

INTERNATIONAL—OEEC countries to import 20 per cent more crude in 1952-53, following termination of ERP, than during the current year. . . . Forecast is predicated on greater capacity of European refineries and availability of Middle East supplies. . . . ¶Lake Maracaibo refinery and deep-water terminal planned by Richmond Exploration Co. to handle crude from newly developed Boscan field. . . . ¶A partly government-owned company will operate Tropical Oil Co.'s Colombian De Mares concession on expiration in August 1951. . . . ¶Construction on three Argentine refineries, a 28,000-bbl. plant near Buenos Aires, a 19,000-bbl. plant near San Lorenzo, and a 9,000-bbl. plant at Lujan de Cuyo, to get under way this summer. . . . ¶Union Petrol Refinery, Ltd., is planning South African refinery. . . .

REFINING—Study of engine wear and fluid travel in pipe lines is possible through use of radioactivity. . . . Application to petroleum use developed by California Research Corp. . . . ¶Six new chemicals from petroleum developed through oxo process. . . .

Experimental model of a portable shot drill capable of being broken down into parts weighing not more than 125 lb. each for packing into difficult locations. This apparatus, undergoing tests at the new research laboratory of Carter Oil Co., is typical of the $100,000,000 spent by the oil industry annually in research of all kinds

Refiners Seek Yield Reduction, New Uses for Fuel Oil Supply

by John C. Casper

PRODUCTION of fuel oil during the current winter has been at such high levels that not only are all foreseeable market requirements fully covered but stocks are increasing so rapidly that refiners are seeking methods to reduce the yield of these products and to develop new sales possibilities.

Stocks of both distillate fuel and residual in districts east of California are higher than they have been since the inventories of these products were first reported separately in 1932. Residual fuel stocks east of California at the end of 1948 were 38,960,000 bbl. compared with 25,824,000 bbl. at the end of 1947 and 31,216,000 bbl. at the end of 1938. Distillate stocks for the same areas amounted to 60,135,000 bbl. at the end of last year compared with the previous year-end high of 47,379,000 bbl. for 1946. It is interesting to note that distillate stocks have exceeded residual stocks at the close of every year since 1940.

California Not Typical

California fuel stocks were much higher before the war than they have been since but these inventories had been accumulating over a long period of time. Since the fuel needs on the Pacific Coast vary widely from the requirements in the other districts, a better picture of the postwar changes in fuel supply and demand can be had by considering the other areas of the country and excluding California.

The continuing build-up in heavy fuel-oil stocks has again focused attention on the major problem confronting petroleum refiners—what to do about heavy-fuel production. The one big engineering need is for some practical method of reducing the yield of heavy fuel and increasing the output of lighter oils. This may result from some form of hydrogenation if a method can be devised that can be carried out at a cost which will permit product sales at reasonable prices.

Some progress has been made within the limits of present processes and is reflected in the decreased yields of residual fuel in 1948. For the year, the yield was 20.1 per cent compared with 21.4 per cent in 1947, 25.0 per cent in 1943, and 21.2 per cent in 1940 and 1941. These lower yields are due in part to the fact that more of our refined products are coming from modern refineries.

Changes in methods of processing are parts of a long-range planning program, but the immediate problem is what to do with the excess heavy fuel that is now in storage. Domestic demand for heavy fuel in 1948 was about 2.5 per cent lower than in 1947 while stocks at the end of the year for areas east of California were about 50 per cent above inventories at the end of the previous year. Fuel used for bunkering vessels in foreign trade decreased by about 10,000,000 bbl. in 1948. Railroad consumption of residual decreased last year as well as the use of heavy fuel by electric-power plants.

Residual fuel oil is one of the few petroleum products with a close time correlation between demand and price. Since heavy oil competes directly with coal and natural gas as a fuel for heavy industries, the price must be in line with that of the other fuels if residual is to remain in this market. Many of the larger fuel users have facilities for quick changeover to either coal or fuel oil, and a price advantage by residual will bring a rapid increase in demand. Refiners are hoping that the recent decreases in the price of heavy fuel have brought about this balance and that the demand for this product will increase. However, the big increases in coal inventories have resulted in a general softening of the bituminous coal spot market, and residual may have to compete with lower priced coal.

Changes Due to Price, Slow

Immediate changes in consumption of distillate fuels will not necessarily follow decreases in the price of this product. In spite of the increased demand for diesel fuels, a large part of our distillate production is marketed for home heating and very few of the home heating units can be shifted from one fuel to another. A general lowering of the price of light heating oils will bring a gradual increase in consumption through the installation of additional burners but will not cause a sudden jump in demand for these fuels.

The volume of heating oil sold for the next 2 months will depend for the most part on the weather. Last winter, the weather was unusually cold in the northeastern and north central states during the first part of the season and resulted in high demands for heating oils for December 1947. Current records indicate that, even with the greater number of consumers this season, domestic demand during this past December may have been slightly less than the year before. The recent cold waves in the western half of the country have not reached the big distillate-consuming areas in the northeast.

To some individual operators, the storage tanks filled with distillate fuel oil may be a problem, but to the refining industry as a whole the high level of stocks is assurance that this season's demand for heating oils can be met without the additional effort required when refineries operate so near their capacities. It may mean a shift of some of the problems from the refining department to the marketing division. For the remainder of this year at least, the question will no longer be "Where can I get products to meet the demands of my customers?" but will be "Where can we find the most profitable market for the products from the refinery?"

YEAR-END STOCKS EAST OF CALIFORNIA

(Thousands of barrels)

	Residual fuels	Distillate fuels
1938	31,216	26,751
1939	25,397	24,056
1940	29,412	32,875
1941	29,760	36,617
1942	17,552	32,755
1943	21,876	31,054
1944	24,336	29,074
1945	19,326	27,910
1946	24,689	47,379
1947	25,824	37,296
1948	38,960	60,135

PERCENTAGE YIELDS FROM CRUDE EAST OF CALIFORNIA

	Kerosine	Distillate	Residual
1939	6.1	12.5	21.4
1940	6.4	14.1	21.2
1941	5.9	13.5	21.2
1942	5.9	15.6	23.0
1943	5.9	15.7	25.0
1944	5.5	15.3	23.8
1945	5.5	15.6	22.7
1946	6.9	17.1	21.6
1947	6.8	17.1	21.4
1948	6.9	19.2	20.1

Oil Research Symposium Included in A.C.S. Meet

Gains made possible in petroleum research through the application of microchemical techniques will be one of the subjects discussed at the national meeting of the American Chemical Society in San Francisco, March 28-April 1. Harry Levin, The Texas Co., Beacon, N. Y., will preside over the symposium on microchemistry.

Also scheduled by the petroleum division is a meeting on "Organic Sulfur Compounds as Related to Petroleum," of which Dr. A. A. O'Kelly, Socony-Vacuum Oil Co., Inc., Paulsboro, N. J., will be chairman.

Krug Tells Committee Government Must Lead Policy Development

WASHINGTON.—Warning that there is nothing in our natural resources picture to warrant complacency, Interior Secretary J. A. Krug this week told the Senate interior and insular affairs committee that the Government must take a more active and a leading part in developing mineral and power policies "to protect and expand our resource base and to encourage individual initiative."

Krug was the first of a long list of Interior officials scheduled to testify before the committee, which, Chairman Joseph C. O'Mahoney of Wyoming said in opening the hearings, "is in search of an improved policy for the conservation, development and administration" of our natural resources.

The inquiry mapped out by O'Mahoney probably will keep the committee busy for some weeks, possibly as late as next March 3 when the Interior Department will celebrate its 100th birthday.

Krug told the committee that both waste and shortages can be licked without the adoption of permanent allocation or other control programs. Among the conditions to be remedied, he said, are the flaring of natural gas which wastes more energy than is produced by the energies of TVA dams; the lack of adequate conservation laws or enforcement programs in some of the states, resulting in the loss of oil, and the unnecessary consumption of gas and oil by utilities because of failure to use all of our water power.

"To be sure," he said, "our immediate shortages are dangerous, and at best troublesome—but it is the continuation of the shortages that shows up our most important problems. Temporary expedients for meeting our failures of foresight must not become a part of our thinking for the long run. Allocations and controls and stockpiling may be necessary in certain times and with respect to certain things, but as a permanent national policy we don't want to allocate scarcities and we can't stockpile energy."

Krug called for participation of private enterprise in the development of remedies for the current situation. In the case of oil, he said, the answer lies in the speed and skill with which we can expand our total supply, and he urged immediate construction of commercial-sized plants for synthetic fuels production because "we know how to make gas and oil out of coal and oil shale on a laboratory or pilot-plant basis but aren't quite sure how these processes will work out commercially yet, and we may need to know in a hurry if another emergency like the last war hits us."

"Our natural oil reserves can be continually expanded if exploration and drilling can be kept profitable and if we work out a reasonable method for developing oil reserves on public lands including submerged land along the coasts," Krug said.

I.P.A.A. Demands Import Curbs, Equitable Steel Distribution

THE executive committee and state vice presidents of the Independent Petroleum Association of America, meeting in Wichita Falls, Tex., January 28, issued statements calling for restrictions on the importation of petroleum and commending the Department of Interior for its efforts to assure maximum production of steel tubular goods.

They also elected Clarence T. Smith, Flora, Ill., to the executive committee and elected 12 new members to the board of directors of the association.

In demanding crude import restrictions of Congress the association said: "An increasing flood of foreign oil is jeopardizing our national economy, our national security, and is resulting in the unemployment of American labor. Two world wars have proved that America cannot depend on foreign oil in an emergency. Foreign oil, thousands of miles away in troubled areas and under the insecure control of a combination of a few importing companies, is a slender thread on which to hang the security of the American people.

"Domestic oil producers since the war have increased the production of crude oil in the United States until they are now more than able to supply every need of the American consumer. The output of domestic oil can be further increased. It will not be increased if this market is absorbed by foreign oil, thus depriving the independent oil producer of the funds necessary to discover and develop adequate reserves in the United States.

"The Independent Petroleum Association of America insists that the Congress should protect the welfare and security of the American people by enacting such legislation as is necessary to restrict petroleum imports to only such quantities as may be needed to supplement domestic production."

While commending the Interior Department on its efforts to assure maximum distribution of tubular goods, the association called on manufacturers and distributors of oil-country tubular goods to recognize the problem of distribution and to voluntarily correct the many inequities that exist. The statement on this subject said in part: "An adequate supply of materials, available to all operators on an equitable basis, is an essential requirement of the petroleum industry.

"There has been serious maldistribution forcing many operators to resort to methods of obtaining supplies that are unsound, inflationary, and restrictive to free competition. Recent surveys made by this association clearly show that many operators are seriously hampered in their development programs because of their inability to get an adequate supply of oil-country tubular goods."

Elected to the association's board of directors were: Dennis O'Connor, Victoria, Tex.; Wilson Heard, Refugio, Tex.; Joe Zeppa, Tyler, Tex.; J. M. Dougherty, Beeville, Tex.; Tom Perry, Corpus Christi; Ellis A. Hall, Abilene; W. C. Partee, Magnolia, Ark.; Joe P. Stafford, Wichita, Kans.; J. W. Starr, Midland; V. C. Perini, Jr., Abilene; J. C. Hunter, Jr., Abilene; and French M. Robertson, Abilene.

(See related story on page 131)

Congress Gets Demands For Oil Investigations

WASHINGTON.—The first demands of the new Congress for oil investigations were filed last week.

In the Senate, an investigation of foreign oil concessions to American oil companies was proposed by Sen. William Langer of North Dakota. In the House, Congressman Secrest of Pennsylvania introduced a resolution for an interstate commerce committee investigation of recent reductions in the price paid to producers of Pennsylvania Grade crude oil.

Langer asked the Senate to order the foreign relations committee to make a full-dress investigation of the granting of oil rights and concessions to American companies by foreign governments and to make recommendations for such legislation "as it may deem advisable."

International

WORLD-WIDE OIL DEVELOPMENTS

Oil Imports by Europe Expected To Increase 20 Per Cent by 1952

WASHINGTON. — Petroleum imports of the Marshall plan countries will be 20 per cent greater in 1952-53, the year following the termination of the European Recovery Program, than during the current year, the first of the program, it is disclosed by the interim report adopted by the Organization for European Economic Cooperation at Paris last month.

The program of the OEEC countries, exclusive of their dependent overseas territories, calls for the importation of $869,000,000 worth of crude in 1952-53, not including United Kingdom imports for reexport, compared with $327,000,000 worth in the current year, both figured at 1948-49 prices, and $632,000,000 worth of petroleum products compared with $938,000,000 worth.

The shift in emphasis from products to crude is predicated upon the anticipated greater availability of Middle East supplies and the development of the European refining industries to process 80 per cent of the requirements of the participating countries, compared with 40 per cent before the war. This, the OEEC pointed out in its report, not only represents an appreciable saving in foreign exchange but makes possible the creation of new ancillary industries.

The report showed that in 1952-53 it is anticipated that $311,000,000 worth of crude will be imported from the Western Hemisphere; during the current year it is contemplated that $145,000,000 worth will be received from the United States, and $14,000,000 worth from other Western Hemisphere countries, a total of $159,000,000. From the nonparticipating sterling area, receipts in 1952-53 are to be $109,000,000 against $78,000,000 this year, and from other nonparticipating countries, $149,000,000 against none this year.

The 1952-53 imports from participating countries calls for $300,000,000 worth from the sterling area gainst $77,000,000. No provision is made for imports from overseas dependent territories, down for $13,000,000 worth this year.

In petroleum products, the 1952-53 forecast calls for $324,000,000 worth from the Western Hemisphere against $512,000,000 this year, of which $506,000,000 is to be from the United States; and $80,000,000 from all other areas which this year will supply $113,000,000 worth, together with $228,000,000 worth from participating countries and their territories against $302,000,000 this year. Again, no provision is made for imports into the mother countries from dependent overseas territories, which will amount to $11,000,000 this year.

A review by the Economic Cooperation Administration shows that between April 3 and December 31, 1948, procurement authorizations were issued for $354,800,000 worth of oil and products, of which $121,400,000 worth was to be secured in the United States, $100,000 in Canada and Newfoundland, $65,500,000 in Latin America, $54,000,000 in participating countries and their dependent territories, and $113,400,000 in other countries.

One thing disclosed by the OEEC report is that more careful thinking is being given to the problem raised by proposals to shift European industry from a coal to an oil economy which were brought forth when the Marshall plan was under consideration a year ago.

Pointing out that the 1952-53 program provides for more than doubling the prewar consumption of petroleum products, the OEEC admitted that "this raises important questions, particularly whether it is wise to expand consumption of imported oil in order to save coal.

"It is premature at this stage to make any recommendation concerning the relationship between coal and oil," the report stated.

"It is only fuel oil and gas oil which can be regarded as substitutes for coal," it was explained. "Increases in the consumption of light oils are essential if the development of agriculture and road transport is to proceed. The proportion of motor spirit representing pleasure motoring is small. Moreover, for technical reasons, an increase in light petroleum products is inevitably accompanied by an increase in black oils at the refining end. The question of coal-oil conversion policy will be studied during the course of more-detailed examination of the recovery program when sufficient information has become available concerning levels of consumption for individual petroleum needs."

Oil Exploration Is Extensive

The report stated that oil fields are being exploited in the Netherlands, Germany, Austria, and the United Kingdom, and the search of oil is going on in France, Italy, and Turkey; drilling has led to the discovery of important supplies of natural gas in France and of oil deposits in Turkey where three wells are reported to have an output of approximately 150 tons per day. In the Far East, not all of the war-damaged installations have been put back into service, but prospecting is being actively pursued in all areas, particularly in the French and Portuguese overseas territories; important new wells have been brought into use in North Borneo and elsewhere, and the presence of natural asphalt in commercial quantities has been proved in Angola.

"No great progress is being made in the production of substitute fuels," the OEEC reported. "An increase in the output of metallurgical coke will lead to an increase also of available benzol, part of which may be used as motor fuel. Even if the synthetic production of oil from lignite, which has been under study in certain countries, proves to be economically possible, according to the programs it will not take place on a sufficient scale to affect the consumption of petroleum products."

Natural gas plays an unimportant part in the economy of the participating countries as a whole, and only France includes this source of energy in its program.

Colombian Government Will Take Over De Mares Concession in 1951

International

A MIXED company with control in the hands of the Colombian Government and its nationals is scheduled to take over operation of the De Mares concession when it expires in August 1951.

Creation of the new Colombian company was authorized by the Congress in a recent action. It will be the first instance of a major oil property reverting to a government through expiration of the concession.

Details of the organization of the new company are left to later action of the government. The De Mares concession, including four fields and producing some 30,000 bbl. daily, is operated by Tropical Oil Co. owned by International Petroleum Co., Ltd., a subsidiary of Standard Oil Co. (N. J.).

The legislation authorizing the Cia. Nacional de Petroleos (National Petroleum Co.) does not alter existing concession rights and leaves unchanged the methods of granting them. The company is to handle properties reverting to the government. There is no assignment of subsoil rights, and the government's royalty presumably will be determined later.

Three Types of Ownership

Three classes of ownership are provided: the government, foreign, and Colombian nationals. Stock held by the government and the Colombian nationals is required to be at least 51 per cent. The De Mares concession and subsequent reverted property is expected to be the government's capital contribution to the enterprise.

Whether any of the foreign companies in Colombia, and especially Tropical, will become a minority partner in the national company remains to be seen. Many Colombian officials have recognized the need for continuing foreign technical and financial assistance.

On August 25, 1951, when the De Mares concession expires, the entire area and all property normally operated on the concession goes to the government. This consists of four going fields, Infantas, La Cira, Colorado, and Galan, a 22,500-bbl. daily refinery at Barranca Bermeja with lubricating-oil and asphalt facilities, and other auxiliary equipment.

The De Mares concession produces roughly half of the country's total output, and the refinery is the only one of importance in Colombia. Production moves through the Andian National Corp., Ltd., 335-mile line to Cartagena Bay.

While De Mares is Tropical's—and Colombia's — principal oil property, the company has an active sales and distribution organization in Colombia and holds considerable nonproducing acreage in other areas. At the beginning of 1948, excluding De Mares, Tropical held 656,365 acres of national lands under concession contracts and 422,000 acres of private lands under leases. Tropical also has a half interest in Cia. de Petroleos Ariguani, S.A., holding concessions covering 3,329,000 acres.

A plan for operating De Mares, following expiration of the concession, has long been a source of concern to the government. Actual equipment on the concession, excluding the crude reserves, has been estimated to be worth about $90,000,000. Last year, the concession was studied by a group of United States experts, including David Donoghue, Fort Worth; George H. Fancher, University of Texas; and W. L. Nelson, Tulsa.

Remaining reserves at expiration will amount to about 35,000,000 bbl., and estimates are that production will drop to about 7,600 bbl. daily in 1958. The total concession area is 1,125,000 acres with about 8,800 acres in the two major producing structures, Infantas and La Cira. Cumulative production to July 1, 1948, was 372,855,000 bbl.

Labor problems have hampered the oil industry in Colombia, and the bill authorizing the new national company provides that the National Petroleum Council will advise the government in these matters.

Plans Being Readied for Three Argentine Plants

CONSTRUCTION work is scheduled to get under way this summer on a new 28,000-bbl. daily capacity refinery near Buenos Aires, a plant which when completed will be one of the most complete and modern processing units in South America.

Engineering work is under way and orders are being placed for materials by M. W. Kellogg Co. which has the contract. The refinery is being built for Yacimientos Petroliferos Fiscales, the Argentine State Oilfields.

Kellogg also has contract with Y.P.F. for the construction of two other refineries, one of 19,000-bbl. daily capacity near San Lorenzo and another of 9,000 bbl. at Lujan de Cuyo in the Province of Mendoza. In addition, the engineering firm is undertaking the construction of a toluene plant for the Argentine Ministry of War.

The three refineries all include fluid catalytic cracking units and will produce substantial amounts of aviation gasoline. They are designed to operate on indigenous crude oil.

Completion of the large plant to be built southwest of the city of Buenos Aires is expected by the end of 1950. A pipe line to the La Plata River to carry crude oil and probably products also is planned.

The refinery, which is expected to serve primarily the Buenos Aires market, will include a delayed coking unit for the production of petroleum coke, the first such facility in South America. Other process units will be: two atmospheric distillation units, fluid catalytic unit, gasoline fractionating unit, catalytic polymerization unit, sulfuric acid alkylation unit, vacuum unit, and thermal cracking unit.

Design work is scheduled to get under way later for the other two plants. The one near San Lorenzo will serve the market in and near Rosario, the second largest city in Argentina.

The toluene plant is regarded as the first such facility to be built in South America. Engineering work is under way and completion is due by the end of 1949. The plant is located near Campana and will use the hydrocatalytic reforming process. Kellogg constructed seven of these plants in the United States as a part of the war effort.

Anglo-Iranian Acquires Refinery in Germany

Anglo-Iranian Oil Co., Ltd., has acquired the Europaeische Tanklager & Transport, A.G., refinery located in Hamburg, Finkenwerder, Germany.

Previous owner of the Eurotank refinery was Davies & Co., Inc., a United States firm which held the German property through a British company. Davies & Co. was controlled by the late W. R. Davies who died during the war.

The plant was damaged during the war in Allied air attacks, but the distillation unit with a capacity of about 3,600 bbl. daily is expected to be ready in the near future to process imported crude. Anglo-Iranian will use the refinery to supply products to Olex BP, its German distributing organization.

Richmond Plans Large Refinery, Terminal for Boscan Field Outlet

by Dahl M. Duff

RICHMOND EXPLORATION CO., wholly owned subsidiary of Standard Oil Co. of California, has disclosed plans for the construction of a refining unit and a deep-water tankship terminal on Lake Maracaibo to handle crude oil from its newly developed Boscan field.

The company recently completed a 25-mile, 18-in. pipe line from the field to Bajo Grande terminal where storage facilities are being built near the refinery site. *(For further details of the 25-mile line see The Oil and Gas Journal, January 6, 1949, page 112).*

The refinery will have a throughput of approximately 35,000 bbl. daily. Potential production of Boscan field is now considered by the company to be 10,000 bbl. daily from 20 completed wells.

The throughput size of the new Richmond refinery emphasizes the company's plans for continued large-scale development work not only at Boscan but elsewhere in its 886,000-acre concession adjacent to the west side of Lake Maracaibo. Oil formations, described by the company as substantial, have been found in four other parts of the Lake Maracaibo concession, one of which produced from the deep Cretaceous pay.

Engineering work for the new refinery is now under way, though no contract for its construction has been let. Completion is slated for June 1950. The company statement said it would process the low-gravity Boscan crude to turn out marketable products.

The company did not discuss process facilities to be installed in the new refinery, but it was reported visbreaking equipment will be used.

A related development linked to Richmond's plans for its Western Venezuela properties was the disclosure of the organization of a new wholly owned Standard of California subsidiary to market crude oil in the United States from both Venezuela and Saudi Arabia. The new company is Calmara Oil Co. which has headquarters in New York.

Much of the Boscan production had been closed in awaiting completion of the pipe-line outlet, and production in August averaged only about 780 bbl. daily, as against the 10,000 bbl. daily estimated potential at the end of 1948.

Eight Rigs Are Active

Eight rigs are now being operated by Richmond in the western concession area. Development has been concentrated in Boscan where producing depths are about 6,500 ft. The field is about 25 miles west of the lake shore.

Richmond has released little definite information on its other discoveries in the Lake Maracaibo area, but results of these tests are regarded as highly favorable. In its latest statement, the company said wells completed at two points in the west central part of the concession showed evidence of commercial possibilities and that another exploratory well, between Boscan and the lake, tested substantial flows of high-pressure gas and distillate.

Another well about 7 miles west of Boscan field, on a separate structural feature, encountered heavy oil similar to the Boscan field crude. The two wells in the west central part of the concessions resulted in evidence of extensive reserves, according to an earlier company report. One of these, on initial tests, produced considerable amounts of 33°-gravity oil from the Cretaceous limestone.

The company said the full importance of these discoveries, other than Boscan, has not yet been ascertained. Considerable significance, however, has been attached to Zulia 26-1, the Richmond well which produced from the Cretaceous.

If the production is substantiated by further drilling, a fourth Cretaceous field would be added in Western Venezuela. The three Cretaceous fields at present, all discovered since 1944, are producing about 168,000 bbl. daily from the prolific limestone formations. Richmond's Zulia 26-1 wildcat near Machiques is reported to have found the Cretaceous pay at about 11,550 ft.

The company said its recent discoveries in Venezuela have proved

Portable drilling rig being moved into Richmond's Maracaibo Basin concession. Company has eight rigs operating in the western concession area

of sufficient importance to justify a large program of commercial development.

The successful culmination thus far of Richmond's work in Venezuela is a part of a record of exploratory effort which, for Standard of California, goes back to the early 1920's. Seeking to develop additional sources of crude, Standard of California first engaged in general reconnaissance of Venezuelan possibilities during 1923-24, and although a commercial producing field of any size was never developed during this time, continued its exploration until 1932.

Richmond was formed as a subsidiary in 1944 and entered its concession agreements with the Venezuelan Government that year. These agreements gave the company rights to explore two large areas, one of about 1,855,000 acres in the Maracaibo basin, and the second approximately 1,060,000 acres on the delta of Orinoco River.

After 3 years of exploratory work, including the drilling of a number of test wells, Richmond took a 40-year lease on parts of the two areas, retaining about 886,000 acres in the Maracaibo area and 421,000 acres in the Orinoco Delta.

The company has hired some 300 technical, clerical, and semiskilled personnel to round out its organization which is based on a nucleus of experienced personnel. Executive headquarters of the company have been set up in Caracas and an operating headquarters established a few miles south of the city of Maracaibo. Camps in the field as yet consist of temporary drilling and construction structures.

Stringing pipe for Richmond's 25-mile crude-oil line from Boscan field to west shore of Lake Maracaibo. The line was recently completed

The new United States marketing company, Calmara Oil, is scheduled to handle products of the new Richmond refinery when it is completed as well as the crude oil which is now available as a result of the completion of the pipe line.

President of Calmara is C. F. Hansen, formerly president of American Gilsonite Co., 50 per cent owned by Standard of California and Barber Oil Corp., and also formerly vice president of Salt Lake Pipe Line Co., a wholly owned Standard of California subsidiary. Hansen earlier was for 8 years chief engineer in the manufacturing department of Standard of California.

Other officers of the company are T. P. O'Neill, vice president, secretary, and treasurer, and G. M. Foster and E. H. Todd, both vice presidents. H. D. Collier, chairman of the board of Standard of California, also is board chairman of Calmara.

Calmara already has sold several cargoes of crude oil from Saudi Arabia which were taken on the East Coast by U. S. refining interests. In addition, the company has sold one experimental cargo of Arabian crude to its parent company. *(The Oil and Gas Journal, December 30, page 133.)*

Standard of California has been carrying out some expansion of the refining and marketing activities which it conducts on the East Coast through subsidiary companies. Capacity of the Barber, N. J., refinery, purchased from Barber Asphalt Co., has been increased from the original 10,000 bbl. daily to 20,000 bbl. daily and will reach 25,000 bbl. daily early in 1949.

Shell Company Plans New Australian Plant

The Australian Shell Oil Co. has announced plans for the construction of a new refinery at Corio Bay near Geelong southwest of Melbourne, Victoria.

Estimated cost of the proposed plan is about $4,800,000. Construction of both the plant and the tanker facilities is expected to begin immediately with completion due in about 2 years. Capacity of the refinery was not given.

Australia's present refinery capacity, including facilities now being built, is about 15,000 bbl. daily. Gasoline rationing is continuing in Australia, and the commonwealth is seeking means of meeting the increasing petroleum demand in spite of dollar restrictions.

International

WORLD-WIDE OIL DEVELOPMENTS

Conorada Begins Staff Organization in New York

CONORADA PETROLEUM CORP. is establishing headquarters in New York and organizing a staff preparatory to commencing foreign exploration work for its three parent companies, Continental Oil Co., Amerada Petroleum Corp., and Ohio Oil Co.

Formation of the new company was disclosed recently in announcements by the parent companies. Conorada is a unique type of company with no exact counterpart in the industry. Its purpose is to investigate likely foreign areas and negotiate for concessions which will then be developed by one or more of the three sponsoring companies.

No moves have yet been made by Conorada for concession rights, though there has been considerable speculation that it will enter Latin America or seek the Saudi Arabian half of the Kuwait-Saudi Arabia neutral zone. Conorada will consider the entire field of possibilities outside the United States and Canada, Canada being excluded since all three of the parent companies have interests in that country, at present.

President of the new company is Arthur A. Curtice, vice president of Hoover, Curtice & Ruby, Inc. Arrangements are now being made for office space in New York. The initial staff will be small, probably not more than six or eight persons, and will include geological and legal personnel.

The announcement of the organization of Conorada said actual acquisition of prospective property and subsequent development will be carried on either by the parent companies direct or by subsidiary companies organized for that purpose. The point at which Conorada will relinquish projects to one or more of the parent companies is expected to depend on circumstances in each particular case, and it is known that the plans for development by one or more of the parent companies are extremely flexible.

Curtice will continue as vice president and will act as a consultant to Exploration Contractors, Inc., the firm which has succeeded Hoover, Curtice & Ruby, Inc. Exploration Contractors will concentrate its efforts on the work in Alaska where it is assisting in the development of Naval Petroleum Reserve No. 4. Hoover, Curtice & Ruby, S. A., of Venezuela, of which Curtice was president, has been dissolved.

XUM

Work Progresses on Creole's "Steep" Inch Line to Caracas

MUCH of the preliminary work has been completed for the construction of the "steep inch," a 10.4-mile pipe line which will carry petroleum products from Catia la Mar to Caracas, Venezuela.

The line is a project of Creole Petroleum Corp. It will begin at the terminal of the Caribbean Sea, cross the Sierra del Avila Mountains, and end at a bulk plant at Nueva Caracas.

Tankage has been erected at Catia la Mar, and work started on the storage at Nueva Caracas. All pipe has been delivered except for the submarine unloading lines, and all work is expected to be completed by the end of the year.

The project was originally estimated to cost $4,500,000. The 8⅝-in. pipe line is relatively short, but in places the gradient is as much as 60 per cent.

Tankage at Catia la Mar includes 30,000 bbl. diesel, 60,000 bbl. motor gasoline, 40,000 bbl. kerosine, 35,000 bbl. aviation gasoline, and 10,000 bbl. white gasoline. About 87,500 bbl. total storage will be erected at Nueva Caracas. Fuel-oil and asphalt storage will be provided later at Catia la Mar.

The submarine delivery lines will be laid later. Initially products will be handled through existing Shell lines to its Catia la Mar terminal.

Completion of the project will provide Caracas with a safe and efficient supply system for petroleum products. At present about 100 round trips by tank trucks are made daily over the mountainous 20-mile road, and other supplies are carried part of the way through two small existing lines and transferred to railroad tank cars. Creole's new line and the pumping facilities are designed to handle liquefied petroleum gas when market conditions permit.

South African Firm Plans Large Refinery

UNION PETROL REFINERY, LTD., has been organized in the Union of South Africa and is planning the construction of a refinery at one of the Union's coastal ports.

Plans made thus far for the refinery are provisional, according to reports received in New York. Cost of the refinery is estimated at £4,000,000 ($20,000,000) but the project is considered as a considerable benefit to South Africa's trade balance through the import of crude rather than refined products.

Officers of the new company are registered in Johannesburg. As tentatively planned, the plant would produce lubricating oil as well as motor fuel and other products.

Organization of the refinery company gives further evidence of the efforts being made by South Africa to reduce the importation of refined products and improve its position in this respect. Plans have been under way for the construction of a plant to convert coal to liquid hydrocarbons, and the Union Government recently announced it expected to issue a license for this purpose to Anglo - Transvaal Consolidated Investment as trustee for a company yet to be formed.

Hydrocarbon Research, Inc., New York, has a contract for the engineering of this plant, and a representative of the company was scheduled to leave South Africa about January 1 for New York for further discussions in connection with the project. Conditions of the proposed government license provide for tight control by the government with only Union nationals as directors of the company.

Venezuelan Crude Price, Output Cut Second Time

ANOTHER reduction in its sales price for crude oil along with a further production cutback and reduced drilling activity has been made by Creole Petroleum Corp. in Venezuela as a result of the continued weak market for heavy fuel oil.

The crude-oil price cuts were the second in about 2 weeks. Bachaquero and Tia Juana heavy crude were reduced 15 cents to $1.85; La Rosa, 11 cents to $2.03; and Tia Juana medium and Quiriquire, 5 cents to $2.24. Creole earlier pointed out 75 per cent of its production is of the heavy fuel-oil type and said the price cuts were being made to stimulate the market.

The company also has made an additional reduction of 6,000 bbl. daily in its production, the new cutback coming in La Rosa. In mid-January the company disclosed it had cut 108,000 bbl. daily in both East and West Venezuela.

During the past month, Creole has curtailed its drilling operations, reducing the number of active rigs from 37 to 34.

International

WORLD-WIDE OIL DEVELOPMENTS

Imperial Sells Holdings In Royalite Oil Co., Ltd.

Imperial Oil, Ltd., is selling its entire holdings in Royalite Oil Co., Ltd., in a transaction involving some $15,000,000 and about 90 per cent of the shares of Royalite.

The sale to Dominion Securities Corp., Ltd., is to be completed as soon as a plan for the reoffering of the stock to the public has been accepted by the Ontario Securities Commission.

Imperial is an affiliate of Standard Oil Co. (N.J.), and the sale of Royalite was interpreted as in line with the company's announced policy of selling assets, where necessary, to obtain cash for expansion. Royalite's principal properties are in Turner Valley field where it has about 150 wells. Production of the company in 1947 was 752,864 bbl.

Oil Exploration in Portugal Continues

Preliminary surveys are continuing in Portugal to determine the oil prospects in that country.

Companhia do Petroleo de Portugal, a company with ownership about equally divided between the Portuguese Government and Swedish interests, holds concession rights in scattered areas which altogether comprise about a fourth of the country's area. Exploration Contractors, formerly Hoover, Curtice & Ruby, Inc., working for Cia. do Petroleo de Portugal, has three geological parties in the field. Drilling plans are as yet indefinite.

Study of Oil Possibilities In Siam Is Progressing

The Siamese Government is undertaking an extensive survey of the country's mineral wealth which will include oil possibilities among other objectives.

Government geologists have reported the discovery of crude-oil deposits in the northern province of Chiengmai, and, according to a report from Bangkok, the Siamese capital, work is now in progress to determine if they are sufficient to justify further exploration and development.

Bill Wrather Garners Honors in Oil Geology He Helped to Found

PRESIDING over the sessions of the American Institute of Mining and Metallurgical Engineers at its San Francisco meeting this month will be its president, Dr. William Embry Wrather, internationally known geologist and director of the U. S. Geological Survey, who got into geology by accident and applied it to the oil industry in the days when scientists had to work in secret.

He was born on a farm in Meade County, Kentucky, in 1883, almost on the banks of the Ohio River. In his early teens he went to Chicago to live with his uncle and attended South Chicago High, or Bowen, as it was known.

There was no geology course in the curriculum of the high school classes in South Chicago nearly 50 years ago. But somehow Jane Perry Cook's love of the science directed her pupil's thoughts in that direction. So Bill Wrather, a Kentucky farm boy transplanted to the big city, began to think of rocks as something other than to be skipped across placid pools in the meadows.

He Aimed at Law

When he graduated from high school the University of Chicago was handy and Bill wanted to be a lawyer. Torts and briefs and contracts never entirely supplanted Miss Jane's influence. Each semester there was some course in geology on his schedule, where he came under the influence of Dr. Rollin D. Salisbury. Everything but final law exams were completed when typhoid laid him low. Convalescence was slow. The doctor advised outside work.

The U. S. Geological Survey had a new recruit in Montana in 1907. He was a tall, gangling young man whose incisive and inquiring mind had even then won him the respect of his associates. The survey employed students during summer vacations. Young Bill became friends with other apprentices named Max Ball, Everett DeGolyer, W. B. (Bill) Heroy, Leon Russ, Ed Hopkins, and Fred H. Kay. It was fascinating work.

He had nearly completed work for his Ph.D. at Chicago when Indian Territory began flexing its biceps and yearning for statehood somewhere around 1908. Glenn Pool had come in and Sapulpa was vying with a lusty neighbor, Tulsa, as the center of a new industry—oil.

With Harry Hanszen, a classroom pal, Bill devoured accounts of this land down under. Hanszen's sister,

WILLIAM E. WRATHER

Miss Lydia, handled land and leasing for J. M. Guffey Petroleum Co. in Beaumont. She wanted her brother to go to work. Hanszen left for Tulsa.

The Mellon interests were starting a pipe line from Oklahoma to the Gulf of Mexico. Cap Arnold came down to Tulsa from Pittsburgh to take charge. Hanszen got a job as Cap's assistant.

Following Cap Arnold's retirement Hanszen's superior was F. A. Leovy, who had been made general manager for Gypsy Oil Co. in Oklahoma. When Bill Wrather came down to Tulsa Hanszen took him to see Leovy.

The Mellon crowd owned or controlled J. M. Guffey Petroleum Co. and Gypsy. Leovy knew of two openings Miss Lydia could offer, both scouting. Two new domes, Goose Creek and Markham, bore watching. Bill took the next train south.

A Skinny Roughneck

C. H. Markham was general manager of Mellon interests at Beaumont. Mellon had financed a number of varied enterprises and it was Markham's task to weld the fragments together.

Would young Bill take it on the chin? Was he willing to learn by hard knocks? Markham put it up to him cold turkey. Bill said yes. So he was shipped over to Anse La Butte, La., where he worked as a roughneck.

The job had its limitations. But Markham knew a comer when he saw one. He brought him back to Beaumont to absorb the routine in headquarters office and promoted his acquaintanceship among certain young brokers and small independents with leases to sell. Soon Wrather became fast friends with W. S. Farish, Lee Blaffer, Ed Simms, and many others engaged in a sort of catch-as-catch-can trading business. At Humble he often ran into Clint Wood, Walter Fondren, and Neils Esperson. Harry Weiss lived with his bride not far down the street in Beaumont. He was just out of Princeton and working for his father.

Geologists worked under cover. No one took them seriously. "Don't let any of those roughnecks know what you are doing," Markham warned, "or they'll throw you in the slush pit." So Bill geologized by remote control.

By 1916 all of the component parts had been fused into one organization known as Gulf Oil Co. Now Wrather openly professed geology—to heck with the roughnecks. He worked out structures in Stephens County and took many leases in North Texas. They made millions for Gulf.

On His Own

But the actors were still in the wings. No one knew that the leases would produce. The Gulf field force viewed geology with a jaundiced eye. Bill Wrather called on Underwood Nazro, general manager at Beaumont—and quit. He wanted to go on his own.

He had heard of Mike Benedum and Joe Trees. Foss Parriott of Pittsburgh was Mike's right-hand man and handled finances. J. B. Lantz worked in Kansas and John Kirkland was production superintendent in Illinois. They formed a shrewd, aggressive group.

Wrather went to work for them in the field under a loose working agreement, memo form. Money was made available for two wildcats. Both were near misses. So Bill kept poking around in the sand hills of Comanche County, Texas, leasing structures. They drilled one more well.

Then it happened—Desdemona. The partners found themselves the epicenter of a full-fledged oil boom. The situation required working capital, lots of it. Bill and his pals sold out. The good earth had labored but something more than a mouse emerged.

Wrather decided upon independent consulting and research. It was 1917. He moved to Dallas. He began to lay the foundations that eventually made him eminent. Mexico, Canada, Spain, Germany, South Africa, Romania, Russia—all passed beneath his roving gaze and became geologically familiar.

Those are some of the reasons why, in the summer of 1942, Dr. Wrather was made associate chief of the Division of Metals and Minerals for procurement of mineral supplies outside

of the United States. In less than a year he had received an appointment as head of the U. S. Geological Survey, made by recommendation of the National Academy of Science. His keen, inquisitive mind and those roots sunk deep in American soil made him an ideal choice for the place.

Honors and doctorates have come to him freely. His seminars and special lectures have been featured at Yale, Chicago, and other leading universities. He was president in 1922-23 of the American Association of Petroleum Geologists, of which he is a charter and lifetime member. He was president of the Society of Economic Geologists in 1934. He is a fellow of the Geological Society of America.

It's a long way back to the seat in old Bowen High where Miss Jane began unfolding secrets of the rocks to a skinny lad in his teens. In the interval a new industry, destined to reshape the American way of life, came into being. And Bill Wrather, who smiles easily, lets the wrinkles play around his eyes. He is thinking how he was practically a gentleman-in-waiting at its bedside the day that it was born.

Petroleum Branch of A.I.M.E. Has Big Part in San Francisco Meeting

THE Petroleum Branch of the American Institute of Mining and Metallurgical Engineers has scheduled a full series of sessions dealing with technical problems and economic and production reviews for its part of the annual A.I.M.E. convention in San Francisco February 13-17.

On the program of the general sessions are important papers on mineral economics, including discussion of America's stake in the world's raw materials and international cooperation in development of natural resources under the proposed charter for the International Trade Organization of the United Nations.

The opening general sessions will be conducted by W. E. Wrather, president of the A.I.M.E. and director of the U. S. Geological Survey, who will turn the gavel over to the incoming president, Lewis E. Young, consulting mining engineer of Pittsburgh. Dr. Robert Gordon Sproul, president of the University of California, will speak at the all-institute banquet February 16.

Installation of Petroleum Branch officers will take place during the meeting. Lloyd E. Elkins, director of production research, Stanolind Oil & Gas Co., Tulsa, takes over the Branch chairmanship from I. W. Alcorn, Pure Oil Co., Houston. Gail Moulton, Chase National Bank, New York, and John E. Sherborne, Union Oil Co. of California, Los Angeles, will serve as vice chairmen. Other members of the Branch executive committee will be Harold Decker, Pan American Production Co., Houston; B. C. Craft, Louisiana State University, Baton Rouge; S. E. Buckley, Humble Oil & Refining Co., Houston; John Murrell, DeGolyer & MacNaughton, Dallas; Paul Andrews, Signal Oil & Gas Co., Los Angeles; and Dean Sheldon, consultant, Los Angeles.

At the banquet on February 15 certificates of service will be presented to F. Julius Fohs, Houston, and J. B. Umpleby, Dallas. Principal address at the banquet will be "The Greeks Had a Word for It," by Reese H. Taylor, president, Union Oil Co. of California.

The petroleum portion of the A.I.M.E. program follows:

Sunday, February 13.—Forum on petroleum geology and geophysics; E. DeGolyer, moderator.

Monday, February 14.—Highlights of worldwide development will be given in a number of 15-minute summaries. Foreign reports will be handled by, or at the delegation of, W. H. Farrand, The Texas Co., New York, and will separate the Far and Middle East, Europe, South America, Canada, and Mexico.

United States summaries will be presented by G. E. Eddy, Michigan Department of Conservation (Northeastern United States); L. E. Porter, Richfield Oil Corp. (California and Pacific Northwest); R. M. Larsen, U. S. G. S., Casper, Wyo. (Rocky Mountain States); Lincoln Elkins, Sohio Petroleum Co., Oklahoma City, (Mid-Continent), and Owen Thornton, The Texas Co., Houston, (Southwestern and Southeastern States).

Tuesday, February 15.—Petroleum economics session. "The Pacific Coast—Its Growth and Its Petroleum," by Austin Cadle, economics department, Standard Oil Co. of California, San Francisco.

"The Recent Canadian Development and its Economic Implications," by H. H. Hewetson, president, Imperial Oil Co., Toronto.

"The Natural Gas Industry in Southern California," by William Moeller, Jr., vice president, Southern California Natural Gas Co., Los Angeles.

Annual Petroleum Branch dinner.

Wednesday, February 16.—Technical Session.

"Steady State Flow in Single-Phase Reservoirs," by F. A. Collins and E. R. Brownscombe, Atlantic Refining Co., Dallas.

"A New Compressibility Correlation for Natural Gases and Its Application to Estimates of Gas in Place," by E. B. Elfrink, C. R. Sandberg, and Terry A. Pollard, Magnolia Petroleum Co., Dallas.

"Application of the La Place Transformation to Flow Problems in Reservoirs," by A. F. van Everdingen, Shell Oil Co., Houston, and William Hurst, consulting engineer, Houston.

"Capillary Pressure Measurements on Porous Materials," by John C. Calhoun, Jr., chairman, Department of Petroleum Engineering, University of Oklahoma, Norman; R. C. Newman and M. Lewis, Jr.

"The Hugoton Gas Field of Kansas, Oklahoma, and Texas," by J. F. Dougherty, DeGolyer & MacNaughton, Dallas.

"Introduction to Induction Logging and Application to Logging of Wells Drilled With Oil-Base Mud," by H. G. Doll, director of research, Schlumberger Well Surveying Corp., Ridgefield, Conn.

"Behavior of Binary, Ternary, and Multicomponent Systems at States Similar to Those Encountered in Condensate Fields," by B. H. Sage and W. N. Lacey, California Institute of Technology, Pasadena.

"Production of Oil Under Unitization in the Wertz Dome Field, Wyoming," by E. A. Swedenborg, U. S. G. S., Casper, Wyo.

Extension Approved for Steel-Allocation Program

WASHINGTON.—A 7-month extension of Public Law 395 was approved by Senate and House banking committees last week after brief hearings at which Secretary of Commerce Charles Sawyer, A. W. Crowley, president of McNamar & Crowley, manufacturers of tank and oilfield production equipment, Salem, Ill., and Colin Timmons, president of Superior Tank Co., Los Angeles, testified in support of the measure.

Extension of the law providing for the making of voluntary allocation agreements, now due to expire February 28, was urged by Sawyer as stop-gap authority for continuance of present agreements pending enactment of the broad stabilization program later to be sent to Congress by President Truman.

Sawyer indicated that the voluntary program, toward which the administration was definitely cool when it was approved by the Eightieth Congress, will be continued under the president's long-range program, but with mandatory allocation authority in the background which could be used if the steel industry refused to make further agreements, such as those on oil-country tubular goods and line pipe which the oil industry and the Interior Department so far have been unable to secure.

Sawyer predicted a shortage this year of 7,000,000 tons of finished steel products, but said that if mandatory powers are secured the present system will be revised to correct flaws.

An earlier survey of the oil-steel situation by the Office of Industry Cooperation showed that production of oil-country goods reached 1,674,876 tons last year, sufficient for drilling 39,121 wells, and will amount to 1,803,103 tons this year, only slightly short of the 1,840,400 tons which it is estimated will be required for the drilling of 43,000 wells. Line-pipe production in 1948 was 2,221,084 tons, slightly more than 200 per cent over the 1936-39 average, and will amount to 2,553,517 tons this year, with a possibility of 2,675,617 tons if nonintegrated mill production reaches capacity and meets oil-industry specification requirements.

Texas Commission "Encouraged" After "Show Cause" Hearing

HOUSTON. — Railroad Commission Chairman William J. Murray, Jr., expressed himself as "pretty much encouraged" following the commission's "show cause" hearing last week on alleged gas flaring in 26 Texas oil fields.

The 26 fields are the second group to be called before the commission to explain gas waste within the past 3 months. Last November, a similar hearing was held on 16 other fields. Following the hearing, the commission ordered the fields shut in until gas waste was stopped. The state rescinded its order for one of the 16 fields. However, the operators took the matter to the courts, and succeeded in obtaining injunctions against shutdowns.

The state has carried one of the court battles—that for Heyser field—to the state Supreme Court. Action by the court is being awaited on this case, which is considered to be a test case. Oil production of the 41 fields is quite impressive—totaling approximately one-third of the state's production.

In the latest hearing this past week, operators indicated that measures have been taken to stop all gas flaring immediately in 7 of the 26 fields. Operators were able to show some progress in complete gas conservation in all but 1 of the remaining 19 fields.

One Field Has No Flaring

Of particular importance was the fact that the big 25,000-well East Texas field could be reported as having no flaring by January 30. The commission, in its show-cause order last month, alleged gas waste of 177,000 M.c.f. daily in the 26 fields.

The Railroad Commission did not indicate at the close of the hearing what further action would be taken in connection with the 26 fields. Some conjectured that the commission would hold action in abeyance until the Heyser field case is decided by the state Supreme Court. Others believed that the commission has accomplished its purpose of goading operators into action and will not issue shutdown orders.

Field - by - field testimony received by the commission can be summarized as follows:

East Texas field.—Ira Butler, Fort Worth attorney, speaking in behalf of Gulf Oil Corp., reported that with respect to the field as a whole there is no flaring or venting of gas at 10 of the field's 12 gasoline plants. He reported that one of these two plants, Arkansas Fuel Oil Co., still flaring would have pipe-line connections for its residue gas immediately. The other, Warren Petroleum Corp., was expected to have facilities for handling residue gas in operation by January 30.

H. P. Nichols, representing the East Texas Oil Association, commended the Railroad Commission for its efforts to stop gas flaring and stated that its action had brought results. With regard to how much gas has been flared in the past, Butler quoted figures prepared by Dr. Philip Dixon, Houston consultant. These figures purported that during November 1948, the total volume of gas entering the plants was 3,230,548 M.c.f., and residue flared was 203,197 M.c.f.

Conoco Driscoll, Jim Wells County; North Katy, Waller County; Redfish Reef, Chambers County; Navarro Crossing, Houston County; Odem, San Patrico County; and Amelia, Jefferson County—Legal uses for all gas at present or within the very near future.

Imogene and Jourdanton, Atascosa County.—Humble Oil & Refining Co. will complete a cycling plant early in 1950 to handle gas from these two fields and Charlotte field in the same county. Plant will have a capacity of 26,000 M.c.f. of gas daily. About 10,000 M.c.f. is being flared in the three fields at present.

Francitas, Jackson County. — Contract being negotiated with Alcoa Chemical Co. and Francitas Gas Co. to handle some 7,000 M.c.f. of gas daily now being flared. Operators expect to be utilizing the gas by next October 1.

Lolita, Jackson County.—Magnolia Petroleum Co. is willing to take the 9,000 M.c.f. of gas now being flared into its West Ranch field to Beaumont Pipe Line. Most operators have expressed willingness to share in the cost of a $1,000,000 gathering system. Flaring is expected to stop by November.

(Continued on page 129)

FPC Calls Off Hugoton Hearings Pending Supreme Court Decision

WASHINGTON.—The Federal Power Commission last week called off a hearing scheduled for February 7 and suspended all further proceedings in its investigation of a proposed gas-for-stock deal between Panhandle Eastern Pipe Line Co. and Hugoton Production Co. pending the outcome of an appeal to the Supreme Court from a decision of the Third Circuit Court of Appeals denying a petition for an injunction to halt the stock distribution.

The commission instituted an investigation last October, after Panhandle organized the Hugoton company and transferred gas reserves in Kansas to it in exchange for Hugoton stock which Panhandle planned to distribute to its own stockholders. The injunction proceedings were initiated November 13 in the U. S. District Court for Delaware, whose denial of the petition was affirmed by the appellate court.

In its decision, the court of appeals sharply narrowed the scope of FPC authority in line, it said, with the phrasing of the Natural Gas Act which provides that the commission shall have authority over the transportation of natural gas and its sale in interstate commerce but not over any other transportation or sale of gas or its local distribution, or to facilities used for such distribution or to the production or gathering of natural gas.

"It would certainly seem from the first half dozen readings of these exclusionary words in the statute that Congress has pretty clearly taken out from its operation and left to state regulation the subject matter of the Panhandle-Hugoton transaction," the court said. "That subject matter was a parcel of gas leases on land in Kansas. It is pretty hard to see why such leases are not facilities used in the production of natural gas. The word 'facilities' has a pretty wide meaning as one looks it up in the dictionary and a glance at the use of the term in court decisions indicates no narrowing of the breadth of the term. We have no reason to think that Congress meant it to be narrowly applied here.

"One is, therefore, immediately confronted with the question: Why, if matters concerning local gas leases are excluded from the scope of the statute, does the commission charged with its administration have anything to do with the transaction between Panhandle and Hugoton?"

The court rejected the commission's contention that it is an established principle of administrative law that the administrative body is, in the first instance, its own judge of the

(Continued on page 130)

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Trimming Europe's Refineries

WASHINGTON.—A complete report on Marshall plan oil, showing the estimated requirements for the fiscal year 1950 and the refining-equipment programs of the Western European countries, is being prepared in the Economic Cooperation Administration for submission to Congress when the appropriation for the European Recovery Program is taken up.

Because of the easing of the world oil situation, the report is expected to state that no difficulties are anticipated in meeting ERP needs over the coming year.

With the immediate products needs of the Marshall plan countries taken care of, the report will probably go into considerable detail with respect to their programs for expansion of refinery industries—just how far, however, will depend on whether all the countries have submitted revised programs in response to a demand made in Parish in December by Walter J. Levy, chief of the ECA petroleum branch.

The country-by-country long-range programs submitted to the Organization for European Economic Cooperation in Paris, providing in the aggregate for some 60,000,000 tons capacity in the fiscal year 1953, the year following the termination of the Marshall plan, are considered by ECA officials to be entirely too high, and Levy called for more realistic schedules which are now being studied by the OEEC.

Although ECA officials have declined to disclose their estimates of the refining capacity which the Western European countries can support without too greatly disrupting world distribution patterns, it has been indicated in other quarters that the capacity should be 40,000,000 to 45,000,000 tons, or roughly two-thirds to three-quarters that contemplated in the European estimates.

Reports to Washington indicate that Levy talked in determined vein at Paris, pointing out the pitfalls of excessive refinery expansion in Europe. It would result in an unbalance of products, for one thing, he said, and create highly unnecessary and undesirable competition not only among European countries but between them and United States companies.

If American oil is driven out of European markets, he pointed out, it will concentrate on dollar markets and British and other oil may lose its position in the latter, with a subsequent loss in dollar exchange more than offsetting their gain through refining rather than importing products.

Levy did not undertake to tell the European countries how far they should build up their refining industries, but did warn them that ECA will not finance overexpansion.

Even on a 40,000,000 to 45,000,000-ton capacity, the Marshall plan countries would be operating at well over double their prewar level.

The discussion of oil, and particularly the prices paid for Middle East oil, is expected to be a feature of hearings on new ERP appropriations. The ECA report will show that the prices paid have been competitive and well under the maximum at which ECA could finance European purchases.

Sterling Oil

A SHRINKAGE of the dollar exchange available in many parts of the world, despite ECA aid, and the increased production of sterling petroleum, threaten to force American oil exporters out of important markets.

The situation already is being felt in Argentina and Sweden, and is seen as likely to spread. Sweden, for instance, which has been short of dollar exchange and has received only moderate ECA aid and has been spending only part of what it got on dollar oil, is now taking British oil for which it can pay in sterling.

Even if the American companies could and would sell their oil for sterling, Sweden would be prevented from buying it by a bilaterial agreement entered into with Britain. The net effect is to put the blocked-sterling system into effect in non-sterling areas.

ECA aid which has raised the level of European production has enabled the British to expand their oil production, and England is engaged in an all-out campaign to build up its foreign trade.

It is charged that the bilateral agreement entered into with Sweden is contrary to the equal-opportunity provisions of the International Trade Organization charter, on the basis of which the United States has been negotiating reciprocal trade agreements with other countries. England is a member of the ITO, whose charter will come before the Senate within a few months for ratification.

The situation is one of much concern to the oil companies as well as in some areas to the State Department, but top officials in the department have shown no inclination to do anything about it. It is possible that the next step will be to take the companies' complaint to Congress and urge that aggressive action be taken to force other participants in the ITO to observe the same rules they expect us to follow in removing discriminations and other barriers hampering a free exchange of goods between the nations of the world.

Club Sandwich Budget

CONGRESS may be able to effect some considerable economies in the President's budget and thus stave off the need for additional taxes—provided it can unravel some complicated bookkeeping.

It was hard enough to understand the double-entry system introduced during the Roosevelt regime, but the budget that went to Congress last month was a three-decker. Under the older system, contract authorizations were not included in expenditures which, accordingly, looked smaller than eventually they would turn out to be.

The 1950 budget, as usual, shows the appropriations that are considered necessary, and in another column the anticipated expenditures, but a third column has been added called "new obligational authority" which is the sum of new appropriations plus new contract authorizations for which no funds are immediately provided but does not include appropriations to liquidate previous contract authorizations. To make it tougher to understand, appropriations comprise new amounts plus those to liquidate previous authorizations; expenditures represent the actual outlay from all appropriations, new and old, and may be either more or less than appropriations.

Take national defense as an example. The budget carries 15.9 billion dollars as the new obligational authority; the appropriation program calls for 15.3 billion dollars and expenditures are estimated at 14.3 billion dollars. The last figure is what it is anticipated actually will be spent during the coming fiscal year; the first may be the eventual cost of the year's defense activities.

Another shift, not entirely unjustified, also makes the budget confusing. In the past tax refunds have been shown as an expenditure; this year they are deducted from tax receipts, with the result that both receipts and

expenditures are about 2 billion dollares less than they would have been under the old bookkeeping.

Max's Empty Shoes

IT isn't the low pay and it isn't the long hours or hard work involved, but the uncertainty over who will head the Interior Department for the long pull and the attitude of the administration toward oil that is making it difficult for the National Petroleum Council to find a man to nominate as head of the Oil and Gas Division to succeed Max W. Ball.

Prior to the November elections, when Ball was urging that a successor be named so he could quit, the several men approached turned the job down because it was expected a new President would be elected who might not care to retain the men appointed to key positions by his predecessor.

In the 2 months since Ball resigned, several others have been urged to take his place, but now the objection seems to be that there has been so much talk that Secretary J. A. Krug would leave the cabinet shortly that a man coming in now couldn't know with whom he would have to deal as head of the department.

At the same time, it has been pointed out that there is considerable uncertainty whether President Truman will modify important administration policies now that he is President by election rather than in the position of merely completing another man's term of office.

In other words, the men who are best fitted for the important job of heading the OGD want to know in advance whom they will have to work with and the policies which, as appointive officials, they may be called upon to support.

Currently, the name of W. W. Vandeveer, president of Allied Oil Co., is most frequently mentioned as Ball's possible successor, but Vandeveer is understood to have raised some points which will have to be clarified before he consents to accept a nomination, if offered.

Oil Group Again

THE House interstate commerce committee may be less of a one-man show under Chairman Robert Crosser of Ohio than it was last Congress under Rep. Charles A. Wolverton of New Jersey.

At any rate, a first step in that direction has been taken in the decision of the committee to return to the set-up in effect prior to 1947, when subcommittees were created to deal with specific subjects.

The extremely board area of legislation covered by the committee makes it impossible for members to become knowledgeable in all the subjects coming before it, whereas experience showed that smaller groups with limited fields could and did in fact become highly expert, notably in the case of the oil subcommittee which was set up in 1934 under former Rep. William P. Cole of Maryland and continued with little change in membership for the next 12 years.

Taking over the chairmanship of the committee in the last Congress, Wolverton, who had been prominent as ranking minority member of the oil subcommittee, abolished the group system and took all legislation into his own hands despite the opposition of many members. All hearings were before the full committee, which in itself made for slower going, and while the committee wound up with a number of reports, very few subjects had been finally disposed of.

This year the committee has a number of new members—nine, in fact, all Democrats—three of whom were returned to Congress after defeat for reelection in 1946 and four of whom are congressional "freshmen" with much to learn. The size of the committee—28 members—makes possible the creation of a number of subcommittees, which not only will make for better and quicker handling of legislation and lighten the burden on individual members but also will relieve the chairman of a lot of work.

Refinery Power Discussed By Electrical Engineers

NEW YORK.—More than 3,000 engineers from all branches of industry are in New York this week attending the annual winter general meeting of the American Institute of Electrical Engineers. A highlight of the meeting is the award of the 1948 Edison Award, given this year to Morris Evans Leeds of Philadelphia, chairman of the board of Leeds & Northrup Co.

Two conferences held during the 5-day session proved of interest to the petroleum industry. At the conference on chemical, electrochemical and electrothermal processes, W. H. Dickinson of Standard Oil Development Co. discussed "Power Wiring in Petroleum Refineries." In a paper titled "Sixty Years of Electrical Distribution in a Petroleum Refinery," J. A. Britton and W. J. O'Meara, Atlantic Refining Co., described the evolution of the company's transmission and distribution system at the Point Breeze refinery, from the original small isolated d.c. generators to the present 13 kv. and 2.3 kv. systems.

W. T. Thagard, Texas Eastern Transmission Corp., Shreveport, discussed the use of electric power in the transportation of natural gas through Big and Little Big Inch pipe lines. In a conference on heat balance, J. B. Glasby, Atlantic Refining Co., discussed the economics of plant-generated versus purchased electric power as it applied to the Point Breeze operations. In his paper, "By-product Power Via Topping Turbines," he reported that power cost had been maintained at roughly half estimated purchase price by generating steam at 650 psi. and 750° F., reducing it through back-pressure topping turbines to 165 psi. to process purposes. This step generated roughly 60 per cent of the plant's 60-cycle power requirements.

A growing interest in the gas turbine was evidenced by two symposia on the subject of its use in power generation. At still another symposium concerning new tools for research, papers were presented on the mass spectrometer, microwave spectroscopy, the electron microscope, electronic digital computers, and X-ray spectroscopy.

Louisiana Group Joins Tidelands Opposition

HOUSTON.—The Louisiana Assessors' Association this week joined the list of state organizations fighting the federal Government's attempt to wrest the tidelands from the states. Meeting in Baton Rouge the group unanimously directed their newly elected president, Max Brodnax, to appoint a committee to draft a resolution commending state and national leaders who are leading the fight.

Secondary Recovery Authorized in South Texas

HOUSTON.—Superior Oil Co. and Bridwell Oil Co. have been given permission by the Railroad Commission to conduct secondary-recovery operations in two South Texas fields.

Superior was authorized to conduct an experimental repressuring operation in Lopex field, Webb County. Bridwell received permission for a pressure maintenance project in Ben Bolt field, Jim Wells County.

Index Ready Soon

The complete editorial index of The Oil and Gas Journal for 1948 is now in preparation and will soon be ready. The complete index, enlarged and improved and with more cross-references, bound separately, will be sent without charge to all subscribers requesting a copy. Address requests to Circulation Department, P.O. Box 1260, Tulsa.

XUM

Wherry Says Big Oil Companies Injure Others, Caused Shortages

WASHINGTON. — Eighteen months of study and 22 public hearings by the Senate small business subcommittee headed by Sen. Kenneth S. Wherry of Nebraska culminated this week in the filing of a report with the Senate charging that the oil industry is dominated by monopolistic integrated companies which are rapidly forcing the independents in all branches out of the business.

The report was largely prepared by Paul Hadlick, special counsel to the subcommittee, and carries the views he expressed during the hearings on the Bureau of Mines forecasts, the Interstate Compact, and the Connally Hot Oil Act. A section recommending divorcement of marketing from other branches of the industry reportedly was eliminated from the final draft because of the fact the subcommittee had not gone specifically into that subject.

Wherry charged that the power of the integrated companies "extends from controlling untold acreage of undeveloped oil lands, which they will not farm out to independent drillers without a call on the oil; to the control of supplies, tubing and line pipe, which independent oil producers are unable to secure; to the operation of pipe lines and gathering systems to the exclusion of the independents, thus forcing the independents to the more expensive transportation by rail freight; to the hoarding of tank cars badly needed by independents; to the power to force the independent refiners to process crude oil for their account or lie idle; to the favoring of distribution through their own controlled outlets, to the detriment of independent oil marketers; and finally to the ability to acquire properties of independents at will."

Sees Monopoly Pattern

Wherry asserted that last winter's shortage could have been averted if the producing states had allowed the wells to flow and the oil been made available to independent refiners.

The report alleged that oil-control policies consist of a series of state and federal statutes, recommendations of integrated-company economists, and market demand reports of the Bureau of Mines, which together "form a perfect pattern of monopolistic control over oil production, the distribution thereof among refiners and distributors, and ultimately the price paid by the public."

Wherry attacked the state conservation laws, particularly those of Texas, declaring that "true conservation practice" would require that gas produced with oil either be returned underground to restore pressure or used commercially. With that requirement, backed up by closing in the wells of violators, he said, the amount of oil a given owner desired to bring to the surface and sell on the market should be left in the well operator's discretion. That policy, pursued in California, has been highly successful, the report indicated.

Wherry made a series of recommendations for consideration by Con-

(Continued on page 130)

Shell Companies Earmark $24,000,000 for Research

OF the $24,000,000 budget adopted by the various Shell companies for worldwide petroleum research during 1949, a substantial portion has been earmarked for use by the Emeryville, Calif., laboratories of the Shell Development Co.

Research in the fields of aviation and agriculture will receive particular attention by the approximately 4,000 scientists and technicians employed by the Shell companies to carry out its world-wide research program.

Because of the rapid development of jet-powered aircraft for military use, the study of fuels and lubricants for jet engines will get increased attention during the coming year, it was pointed out by H. S. M. Burns, president of Shell Oil Co., Inc.

To meet the increasing demands of the world's food supplies, emphasis will be placed also on research for developing agricultural aids. At Modesto, Calif., Shell maintains an agricultural laboratory and test farm which serves as a proving ground for oil-derived chemicals, including fertilizers, weed-killers, insecticides and fungicides.

Included in the huge research program besides the Shell Development Co. are research centers at Houston, Tex.; Wood River, Ill.; Deer Park, Tex.; and Wilmington and Martinez, Calif.

1948 Oil Tax Revenues To Exceed 1947 Receipts

WASHINGTON.—Heavy year-end payments brought Treasury collections from the three oil taxes to just short of $600,000,000 for 1948, an increase of approximately $48,000,000 over the 1947 receipts, it is indicated by preliminary figures of the Bureau of Internal Revenue.

Indicated collections were $599,891,000 against $552,029,000 for 1947, made up of $498,364,790 from gasoline, against $455,350,120; $81,883,450 from lubricating oil, against $78,649,309; and $19,643,185 from pipe-line transportation, against $18,029,961.

December receipts, the bureau announced, included $53,869,493 from gasoline, against $49,040,907 in the same month of 1947; $6,843,157 from lubricating oil, against $8,552,554; and $2,316,524 from pipe-line transportation, against $1,799,999.

The bureau's year-end report showed that despite the cut in individual income taxes 1948 collections from all sources topped $42 billion, increasing some $3 billion over 1947.

The figures indicated, however, that the increase in 1949 over 1948 will be relatively less, receipts of $17,848,574,000 for the final half of last year being only $438,321,000 greater than for the corresponding period of 1947.

Next Week

"Largest" Separation Stations.—In a $1,900,000 program, operators in the Old Ocean field, Texas Gulf Coast, have installed two of the largest gas-oil separation stations in the world. These are part of a $3,000,000 expenditure for more efficient operation of surface facilities in the new—and again the "largest"—voluntarily unitized oil and gas field in the United States.

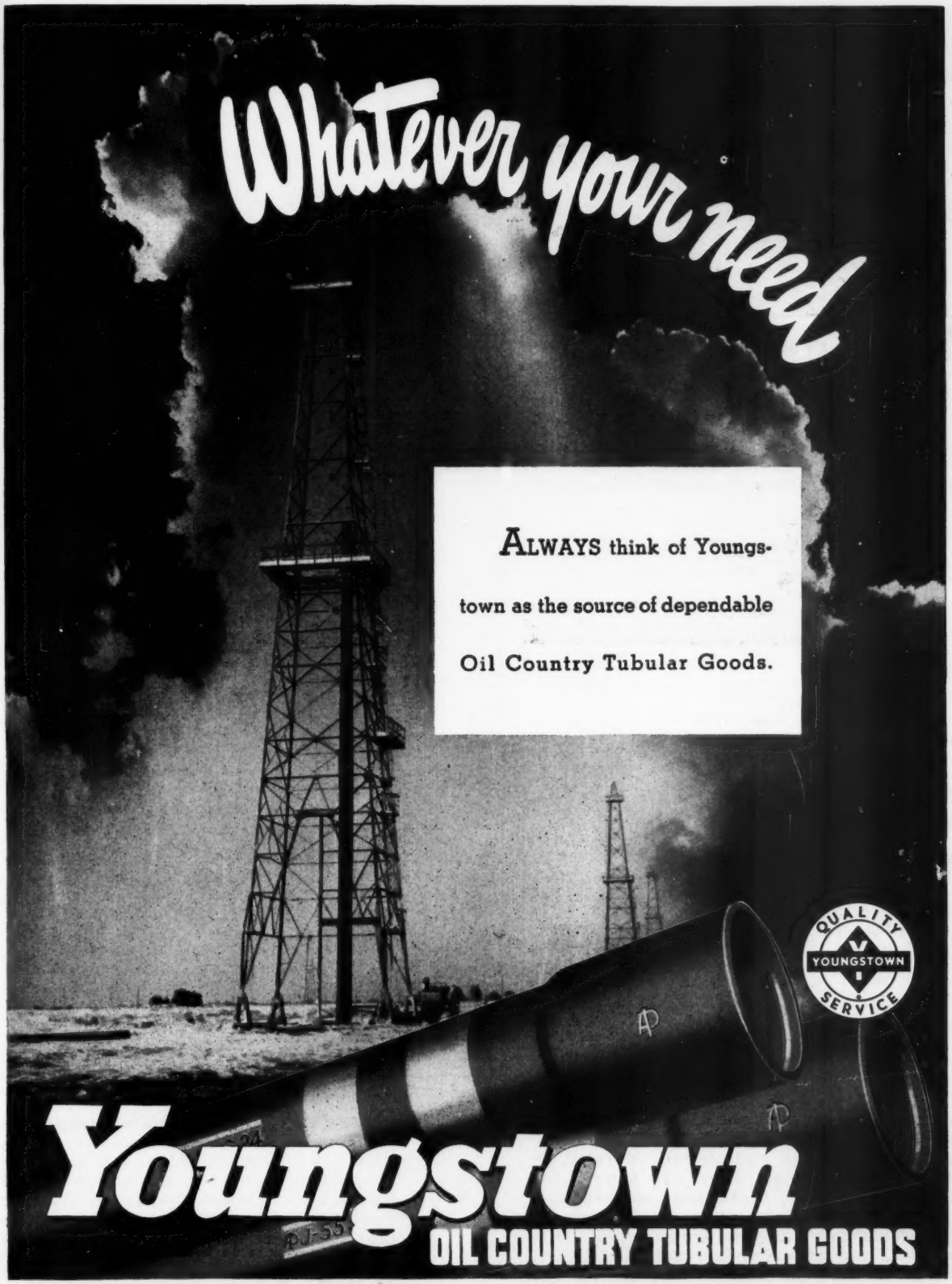
Corrosion Inhibition.—Solution of corrosion problems in pipe-line system, tankers, and petroleum distribution equipment.

Design of New Main-Line Gas-Compressor Stations.—Article by E. S. Murray, assistant chief engineer, Tennessee Gas Transmission Co.

Atlanta Oil Field, Columbia County, Arkansas.—Detailed engineering report by C. H. Riggs, petroleum engineer with U. S. Bureau of Mines.

$6,000,000 Plant in Eastern Venezuela.—D. H. Stormont of the Journal's engineering staff gives an on-the-spot account of Creole Petroleum Corp.'s second new multipurpose field plant. In the Mulata field, it consists of (1) crude-oil stabilization facilities, (2) electrical crude oil desalting, (3) absorption and gasoline stabilizing section, (4) compression plant for pressure maintenance at 2,200 psi.

XUM



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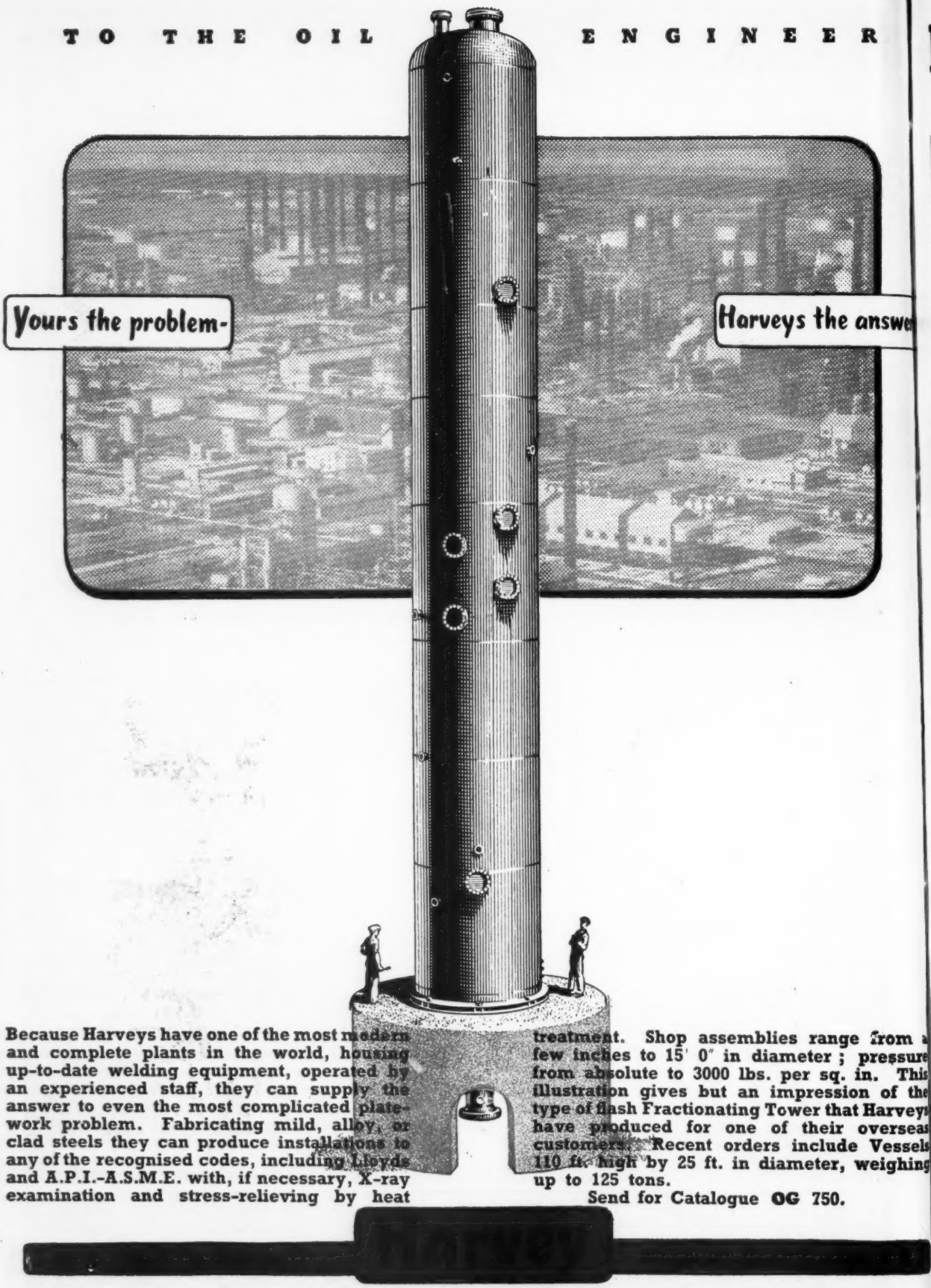

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HARVEYS

PERSONALS

Locke Named Exploration Manager of Mid-Continent

EDGAR R. LOCKE has been appointed as manager of the exploration department, Mid-Continent Petroleum Corp., and will make his headquarters in Tulsa. He will take charge of all geological and geophysical operations for the company, with G. N. Smith and A. L. Beekly remaining as chief geophysicist and chief geologist, respectively.

Until the first of this year Locke was in charge of geophysical operations in the Rocky Mountain area, with offices in Denver, for The Texas Co. He entered the oil business in 1933, joining Texaco at that time. He is a 1929 graduate mining and geology engineer from Colorado School of Mines. In 1942 he entered active duty in the U. S. Army as a major in the Engineering Corps and for 3 years was in the Southwest Pacific as petroleum officer supervising construction and operation of pipe lines and storage tanks which supplied gasoline to fighting forces. After the war he rejoined Texaco as field superintendent for the geophysical division in Houston.

H. E. Treichler has been named vice president and general manager of Texas Gulf Sulphur Co. Treichler has been with the company 30 years and has been general manager since 1930.

Charles W. Alcorn, Falcon-Seaboard Drilling Co., has been elected chairman of the Houston chapter of the American Petroleum Institute's division of production. He succeeds **T. J. Fuson** of Humble Oil & Refining Co. Other new officers are: **E. O. Buck,** National Bank of Commerce, first vice chairman; **Douglas Ragland,** Humble Oil & Refining Co., second vice chairman; and **Dr. George Grey,** Baroid Sales Division of National Lead Co., secretary-treasurer.

A. C. Pilger, Jr., field research engineer with Tide Water Associated Oil Co., has received the 1947 Horning Memorial Medal of the Society of Automotive Engineers. The award was presented at the annual meeting of the society held in Detroit, January 13. Pilger won the award for his paper, "Field Testing of Motor Oils and Gasolines," presented at the 1947 S.A.E. meeting at French Lick, Ind. Established in the memory of the late Harry L. Horning, 1925 S.A.E. president, the award is for the best paper on adaptation of engines to fuels or fuels to engines.

H. W. Fisher, a director and general manager of East Coast refineries of Esso Standard Oil Co., has been appointed deputy coordinator of refining activities for Standard Oil Co. (N. J.). Fisher joined the Jersey Standard organization 21 years ago, after graduation from Massachusetts Institute of Technology as a chemical engineer. In 1945 he was elected a director of Esso Standard and in 1948 he was appointed manager of the company's East Coast refineries.

Edward P. Mooney, drilling foreman of Shell Oil Co., Inc., formerly at Oilfields, Calif., has been transferred to Bakersfield.

Z. C. Ambrose, vice president and director of Southwest Gas Producing Co. and Carbons Consolidated, Monroe, La., was recently elected a director of the parent company, Commonwealth Gas Corp., New York City.

J. O. Briggs, retail sales manager, Skelly Oil Co., Kansas City, Mo., and **Merl Crabtree,** wholesale sales manager, Cities Service Oil Co., St. Louis, Mo., have been appointed chairman and vice chairman respectively of the Missouri section of the Oil Industry Information Committee. Briggs replaces **L. C. Pfaff** who has been made chairman of the committee for Missouri, Iowa, and Nebraska.

Garland Diggs, formerly connected with an oil-field supply firm, has joined **Sam E. Wilson, Jr.,** Corpus Christi, Tex., independent producer. Diggs will have his headquarters in Shreveport to supervise Wilson's Louisiana and East Texas properties.

D. R. JOHNSON

D. R. Johnson, formerly manager of the southern region of the manufacturing department, Continental Oil Co., has been appointed manager of the manufacturing department with supervision over the company's eight refineries. Johnson will be succeeded by **L. W. Vickery,** superintendent of the company's Ponca City plant. **Charles D. Hull,** assistant to the vice president, will succeed Vickery at the Ponca City refinery and **C. B. Round,** formerly analyst in the coordinating and planning department, will replace Hull as assistant to the vice president. Johnson, an electrical engineering graduate of University of Colorado, joined Continental as an electrician in 1924. In 1929 he was made inspector and technologist in the Ponca City plant, later becoming chief inspector, assistant to the manufacturing manager, assistant superintendent and superintendent of the plant. He was appointed southern region manager early in 1948.

James D. Harris, district engineer, Core Laboratories, Inc., will direct the activities of that company's new offices at Denver. The new, permanent offices at Denver, together with laboratory facilities located at Worland, Wyo., will serve the Rocky Mountain states.

F. A. DAVIES

Fred A. Davies, vice president in charge of production and exploration, Arabian American Oil Co., has been elected executive vice president of the company and will assist **W. F. Moore,** Aramco's president, in direction of all phases of the company's operations. Davies has also been elected a vice president of Trans-Arabian Pipe Line Co., a position in which he will coordinate Aramco and Tapline government-relations activities in the Middle East. A mining engineer and

petroleum geologist, he has been associated with Aramco since the earliest days of its activities in the Persian Gulf area. He was elected vice president of that company in 1947.

O. D. Hyndman of Leona, Tex., has been named secretary of the Texas Railroad Commission. He succeeds **K. C. Miller** who announced his resignation to join an oil and gas reporting service in Austin. Hyndman has been with the gas utilities division of the commission since 1945.

G. T. Tennison has been named regional gas manager, Houston region, Shell Oil Co., Inc., in a move to decentralize activities of the regional gas-gasoline department. Tennison is to be assisted by **E. S. Quinn,** as regional gas representative handling gas contracts and measurement; and by **J. H. Heafer, Jr.,** as regional gas representative for volatiles. To handle gas engineering and technology, two new sections have been established in the engineering division of the regional production department, under the supervision of regional mechanical engineer **Paul L. Guarin. J. T. Jordan** heads the technology section and **M. R. Church** the gas engineering section. In the decentralization move, the following transfers from the Houston region staff are being made: to Houston area, **F. A. Burdick** and **K. H. Rhoads,** gas engineers; **J. A. Golasinski,** gas test engineer; to Midland area, **E. L. McKenzie,** gas engineer; **L. D. Wesling,** storekeeper; to New Orleans area, **Dr. R. E. Baker,** area gas manager; **J. M. Dillon, M. L. Newmaster,** and **R. E. Mitchell,** gas engineers.

Bruce C. Clardy, Standard Oil Co. (Ind.), has been appointed chairman of a group on pipe lines, under the Office of Defense Transportation to advise the National Securities Resources Board on the transportation setup for the next war.

William J. Carthaus, general sales manager, Deep Rock Oil Corp., has been promoted to the position of assistant to the president. His headquarters will be in Tulsa and his new duties will embrace all phases of refinery modernization and manufacturing research. Following graduation in 1920 from University of Illinois, Carthaus did special graduate work at Massachusetts Institute of Technology and became associated with Cities Service Oil Co. and later with Shell Oil Co., Inc. He joined Deep Rock in 1929 as manager of naphtha and specialty sales, became assistant to the general sales manager in 1933 and general sales manager in 1938.

I. D. Davidson, managing director of Cia. Mexicana de Petroleo El Aguila, S.A. (Shell), is returning to London to become manager of the production department of the Shell companies. Davidson joined Shell in London in 1921 and went to Mexico in 1936. In Mexico, Davidson is being relieved by **Ralph Emery,** who has been general manager of the Shell organization in Peru since September 1947. Emery is being succeeded by **P. G. Elburn,** who is being transferred from Argentina.

S. T. Yuster, Pennsylvania State College, will act as advisor on the production research program of the Pennsylvania Grade Crude Oil Association. Chief of the petroleum and natural gas division, school of mineral industries at State College, Dr. Yuster heads the school's petroleum production activities.

J. R. Carringer, vice president of Esso Standard Oil Co., has been appointed assistant to the president in a series of organization changes. **Dr. H. G. Burks, Jr.,** general manager of manufacturing for the company, has been elected a vice president and will succeed Carringer as contact director for the manufacturing, supply and transportation, and chemical products departments. Carringer was elected a

J. R. CARRINGER

DR. H. G. BURKS, JR.

vice president in charge of manufacturing for Standard Oil Co. (N. J.) in 1943. He has been associated with petroleum manufacturing throughout his working career. In 1914 he was associated with E. M. Clark in the development of the Burton-Clark pressure still, a forerunner of the modern catalytic cracking process. Burks joined the company as development engineer in 1924. He was elected a director of the company in 1943 and is also a director of Standard Oil Development Co.

E. R. Grey, formerly assistant superintendent in charge of construction and maintenance, Mexican Petroleum Corp. of Georgia, has been made superintendent of the company's Savannah refinery. Mexican Petroleum is an affiliate of Pan American Refining Corp.

Rocky Mountain Oil and Gas Association has named the following committee chairmen: **Fred Manning, Jr.,** Denver drilling contractor, arrangements committee; **Al Deaton,** Carter Oil Co., legal and legislative committee; **H. H. Arnold, Jr.,** production committee; **John McIntire,** Northern Utilities Co., natural gas committee; and **Paul Hirth,** Continental Oil Co., public relations committee.

Newly elected officers of the Central Oklahoma chapter of American Petroleum Institute are shown in the above group photograph taken at their January meeting in Oklahoma City. Front row: G. E. Saunders, Sohio Petroleum Co., secretary-treasurer; T. E. Ockershauser, Globe Oil & Refining Co., first vice chairman; W. R. Gottshall, Continental Supply Co., vice chairman, membership; Myron M. Kinley, M. M. Kinley & Co., principal speaker; S. H. Rockwood, Shell Oil Co., Inc., vice chairman, programs. Back row: J. H. Field, Sohio Petroleum Co., chairman, advisory committee; R. E. Featherston, Fred Eldean Organization, Inc.; Carl A. Young, national secretary, A.P.I. division of production; W. M. Edinger, Oklahoma City, chairman; C. McPeek, Sohio Petroleum Co., speaker; and J. A. Kornfeld, Sohio Petroleum Co., vice chairman, publicity

C. W. Sternberg, formerly geologist for Atlantic Refining Co., has been made division geologist for Sunray Oil Corp. and will work out of Denver.

William E. Richardson, geological department of Stanolind Oil & Gas Co. in Tyler, Tex., resigned to join Midstates Oil Corp., Wichita.

M. W. BOYER

M. W. Boyer, vice president, Esso Standard Oil Co. and general manager of its Baton Rouge refinery has been placed in charge of all manufacturing operations of the company, with headquarters in New York. The appointment was made effective February 1. **Cecil Morgan,** associate general counsel of the company, with offices in Baton Rouge, assumed charge of manufacturing, public relations, and crude-oil-purchasing operations of the company's Louisiana division, replacing Boyer, and was also elected a vice president. **H. J. Voorhies,** assistant general manager of the Baton Rouge plant, became general manager. **H. G. Mangelsdorf,** assistant to the general manager, replaces Voorhies as assistant general manager. Boyer joined Esso in 1927 as a chemical engineer in the Esso research laboratories. He was made assistant director of the laboratories a year later and director in 1930. He became head of the technical division in 1931 and 2 years later was made general superintendent of the refinery. In 1935 he was appointed assistant general manager and in 1936, general manager of the Baton Rouge plant. In 1945 he was made vice president and director of Esso Standard Oil Co.

J. M. Cooper, assistant superintendent of production for Gulf Oil Corp., Houston district, has been appointed assistant managing director of Kuwait Oil Co. Kuwait is jointly owned by Anglo-Iranian Oil Co., Ltd., and Gulf. Cooper's headquarters will be in London. He has been an employe of Gulf since 1923 when he completed his education as a production engineer at Carnegie Institute of Technology. He was made mechanical engineer in 1928 and in 1937 became a division production engineer, and in 1945, chief production engineer, Houston district.

H. Durst, Humble Oil & Refining Co., district petroleum engineer at Grand Isle, Louisiana division, has been promoted to assistant superintendent in the Bayou Sale district, replacing **R. H. Ussery** who was promoted to district superintendent at Grand Isle. **V. O. Harris,** former Grand Isle superintendent, went to Lovell Lake district to replace **R. K. Tracy,** who was transferred to Galveston Bay district. **W. T. Dabbs,** superintendent of the Bayou Sale district, has been transferred to the newly-established Colorado City, Tex., district as district superintendent. **J. S. Hacker,** district civil engineer, East Texas, has been transferred to the Pickington gasoline plant construction district. **J. H. Sorrells** has been made superintendent of the Tomoconnor gas plant, replacing **M. A. Mills** who was transferred to East Texas gas plants. **William C. Klett,** senior engineer in southwest Texas, has been transferred to Flour Bluff gas plant construction district as district civil engineer. **J. L. Lamberson,** petroleum engineer, Gulf Coast division office, has been transferred to the Sugarland district as district petroleum engineer.

Dr. W. L. Linton, Socony-Vacuum Oil Co., Inc., until now, superintendent of the Sone & Fleming refinery, will become manager of all of the company's East River refinery operations. **E. F. Pinney** will become superintendent of the Pratt Works, replacing **R. B. Malone** who retired the first of the year after 45 years' service. **F. W. Hadley** will be superintendent of Sone & Fleming plant, replacing Linton, and **E. J. Tully** becomes superintendent of the grease and compounding department.

SHIFTS—

Walter M. Moody, engineer, Seaboard Oil Co. of Delaware, San Marino to Avenal, Calif.; **Jerry Covington,** geologist, Humble Oil & Refining Co., Tularosa, N. M., to Van Hope, Tex.; **R. N. Harding,** geologist, The Texas Co., Farmington, N. M., to Denver; **L. A. Shutt,** superintendent, Phillips Petroleum Co., Roswell, N. M., to Uvalde, Tex.; **W. J. Armstrong,** foreman, Sun Oil Co., Delmita to Beaumont, Tex.; **Vergil L. Garlington,** engineer, Humble Oil & Refining Co., Bellaire to Conroe, Tex.

Etheridge Dibrell, superintendent, Sun Oil Co., Conroe to Beaumont, Tex.; **Joe Dixon,** superintendent, Tex Harvey Oil Co., Dallas to Midland; **M. L. Thornton,** superintendent, Tex Harvey Oil Co., Dallas to Kilgore, Tex.; **J. A. Ritter,** engineer, Sun Oil Co., Dallas to Field, Tex.; **R. E. Mitchell,** engineer, Shell Oil Co., Inc., Houston to New Orleans; **John G. Yeager,** engineer, Humble Oil & Refining Co., Houston to Minneapolis, Minn.

J. J. Cowden, geologist, Continental Oil Co., Luling to Hebbronville, Tex.; **Vernon P. Cantwell,** engineer, Pan American Production Co., Lyford, Tex., to Houston; **S. B. Summers,** superintendent, Warren Petroleum Corp., McLean to Gladewater, Tex.; **John Curtis Thrash, Jr.,** engineer, The Texas Co., Odessa to Penwell, Tex.; **Lewis W. Hall,** engineer, Stanolind Oil & Gas Co., Pampa, Tex., to Tulsa.

DEATHS

William A. Dean, 83, an officer of Great Expectations Oil Co., died January 20 at Fort Worth.

Francis W. O'Brien, 55, manager of the Sewaren, N. J., terminal of Shell Oil Co., Inc., died January 24 in New York City.

John Victor Dippel, 62, retired western district manager for Sinclair Refining Co., died January 23 at Kansas City.

James E. Dutton, 68, former division superintendent for Sinclair Pipe Line Co., died January 26 at Wewoka, Okla.

T. O. Shappell, 72, pioneer Mid-Continent oil operator, died January 22 at Carlsbad, N. M.

Stanley H. Brown, 50, secretary-treasurer and landman for Petroleum, Inc., died January 21 at Wichita.

James W. Lomax, 50, president of Oil Tools, Inc., and owner of Lomax Supply Co., died January 25 at Houston.

Robert J. Shannon, 73, retired employe of Gulf Oil Corp., died January 21 in Beaumont, Tex.

Evart E. Overton, formerly marketing director for the Office of Petroleum Coordinator, died January 27 in New York.

Noah S. Taylor, independent drilling contractor, Bosier City, La., was killed in a rig accident, January 22 near McLeod, Tex.

HIGH - ANGLE DIRECTIONAL HOLES EXPAND TIDELANDS DRILLING RANGE

57° ATTAINED BY MAGNOLIA WELL

by Gordon B. Nicholson

AN example of the application of a flexible directional drilling program for tidelands prospecting is seen in Magnolia Petroleum Co.'s attempts to discover oil production from the salt dome under Blocks 77 and 62, located some 35 miles out in the Gulf of Mexico from the mouth of the Atchafalaya River, Louisiana Coast. Drilling from a relatively small platform and searching for shallow production from the flanks of a dome located early in 1948, Magnolia probed the subsurface area with directional holes, carrying extremely high angles and obtaining unusual distance in total deflection (see Fig. 1).

Although numerous features of the directional-drilling work employed by Magnolia on Block 62 are outstanding, several warrant special consideration by representing achievements in a comparatively "unknown" field, and thus provide an interesting as well as constructive basis for future drilling in the Gulf of Mexico. The noteworthy features are summed up as follows:

1. Securing of an abnormally high "drift/depth ratio" (1.58) by successfully drilling with high angles (up to 57½°) established at shallow depths, permitting a rapid rate of deflection per foot drilled without a proportionate increase in operational problems.

2. Accomplishment of two high-angle sidetracking operations, deflecting toward the high side of the hole, combining sidetracking with an increase in drift angle.

3. Exclusive use of a dual-purpose full gage deflecting tool (spud bit) which, adaptable for either rotary drilling or spudding, is oriented and set in position as often as desired without removing from the hole, facilitating directing the hole toward its objective with little delay in drilling operations, and reducing the number of round trips.

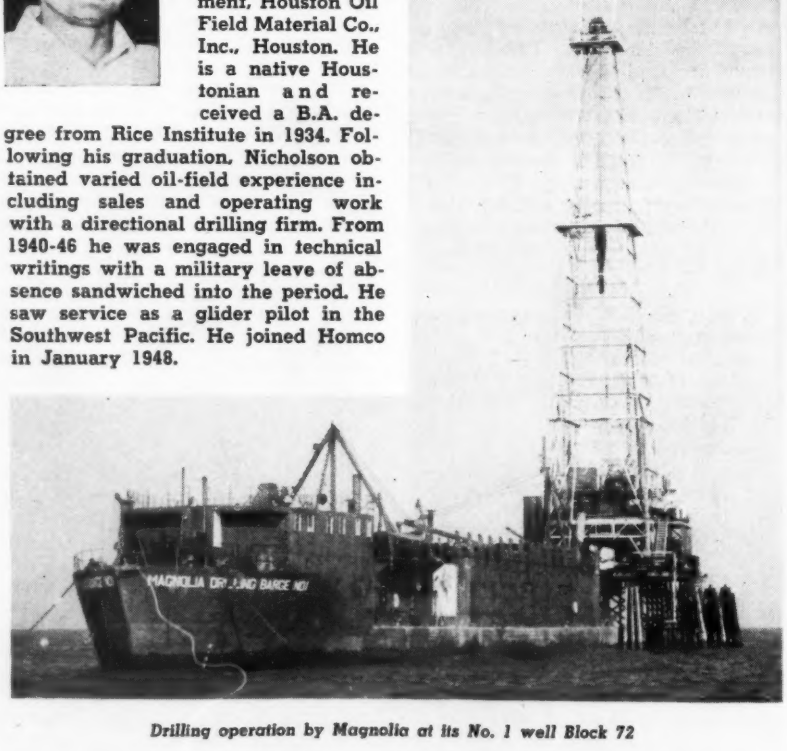
Undoubtedly, the directional drilling employed on Block 62 established a number of records for directional drilling on the Gulf Coast, in addition to opening a new concept of the possibilities offered by the use of directional holes in the tidelands. With the high angles reached in drilling on Block 62, it is now a matter of record that it is both possible and practical to reach angles approaching 60° from the vertical, and possibly greater, without mishap, at depths less than 1,800 ft. below the surface of the gulf. Such drift angles open an extensive new area for drilling from a single platform, with the bit able to penetrate any point within a circle of an extremely large radius which increases materially with greater depths. Thus, a greater subsurface area explorable from one rig location is opened; and likewise, an increased number of properly spaced wells may be completed in an oil pool although drilled from a single platform.

Fast drilling was realized by the use of the Homco deflecting bit which is oriented to change drift angle or direction without pulling from the hole. In several instances, under supervision of Homco directional drilling engineers, this full-gage deflecting tool remained on bottom while drilling 300 to 400 ft. of hole, being reset four or five times while increasing the drift angle by 20° to 25°. Use of the bit in the soft and medium formations characteristic of shallow depths under Block 62 offered not only a means of expediting the directional-drilling processes, but also lessened the possibility of sticking the drill pipe due to its relatively small dimensions. Construction of the spud bit allows drilling a full-gage hole although the bit itself is somewhat undersized. Its design also permits spudding for oriented deflection in a specific direction, in addition to rotating for normal drilling.

As part of Magnolia Petroleum Co.'s proposed extensive offshore development, work on the site of Blocks 77 and 62 started early this year, with

The Author

Gordon B. Nicholson, author of this article, is chief engineer of the directional drilling department, Houston Oil Field Material Co., Inc., Houston. He is a native Houstonian and received a B.A. degree from Rice Institute in 1934. Following his graduation, Nicholson obtained varied oil-field experience including sales and operating work with a directional drilling firm. From 1940-46 he was engaged in technical writings with a military leave of absence sandwiched into the period. He saw service as a glider pilot in the Southwest Pacific. He joined Homco in January 1948.



Drilling operation by Magnolia at its No. 1 well Block 72

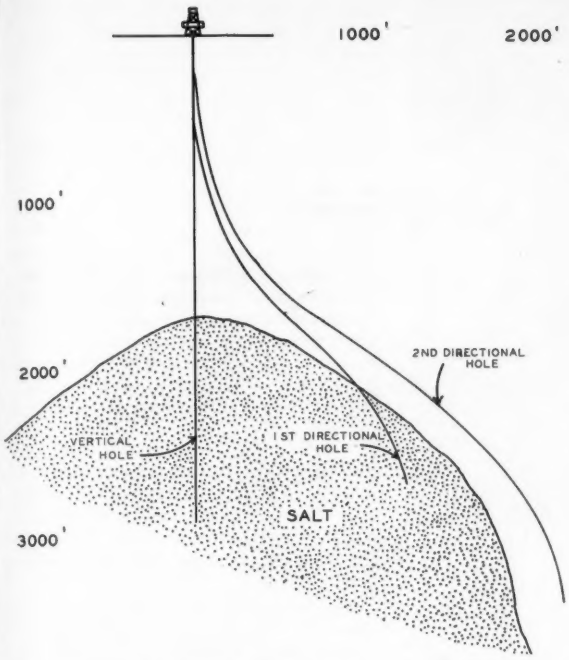


Fig. 1—Diagram shows the objective of Magnolia's probing underneath Block 62 with directional wells, in an attempt to overshoot the edge of the salt and find oil near the flanks

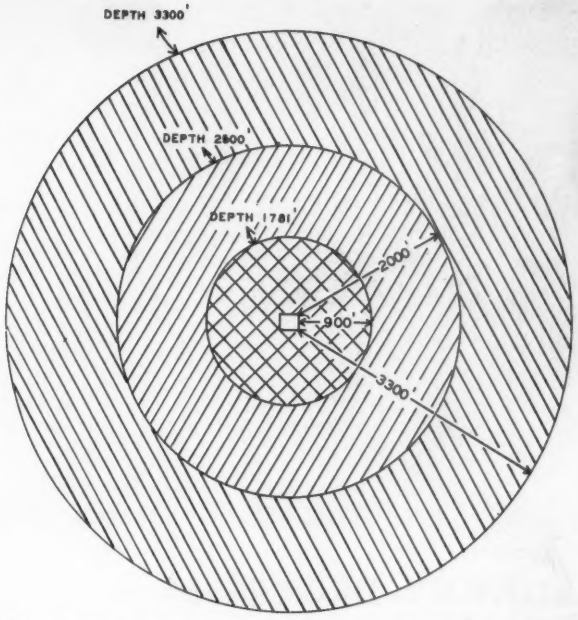


Fig. 2—Heavily shaded area in the center of horizontal projection represents area explorable from a central site with a 900-ft. deflection at a depth of 1,781 ft., as was accomplished by Magnolia on Block 62. With the hole projected deeper while carrying the maximum angle, the area within the inner light-shaded circle is explorable at 2,500 ft., while if carried to 3,300 ft., any point within the outer circle may be reached

the first hole drilled vertically as Well No. 1, Block 77, the derrick mounted on a platform located on this block. Subsequent wells were deflected toward the northeast, with the bottoms extending outward underneath the adjacent Block 62. The two directional wells were designated as Block 62, Wells No. 1 and 2. The vertical hole entered the salt at about 1,700 ft., and drilled to a total depth of 3,800 ft. while still in salt.

After making the decision to abandon the vertical hole, the derrick was skidded 6 ft. toward the east, and plans formulated to drill directionally toward the northeast in an effort to overshoot the edge of the salt and drill down along the flanks. Homco directional-drilling engineers dispatched to the location to supervise the directional work, set the first tool, a deflecting bit, below the conductor pipe at approximately 300 ft. At 1,000 ft. measured depth, the drift angle had reached 24° from vertical; at 1,500 ft., the angle was 42°, with the deflecting bit being the only tool used. Maximum angle reached during the portion of the hole down to a measured 2,264 ft. was 52°. At this point, circulation was lost and the pipe stuck, necessitating plugging back to 1,514 ft.

Sidetracking the plug resulted in another noteworthy directional operation. The spud bit was set on top of the plug where the hole indicated a deviation angle of 40°. Desiring to obtain a greater deflection than the original hole, the plug was sidetracked on the high side, with the next survey picture taken at 1,531 ft. showing a substantial increase in drift angle. The angle was increased further by the use of the spud bit and selective drilling, reaching a maximum of 56½° at 1,975 ft. At this point, believing that the bottom of the hole had suc-

(Continued on page 83)

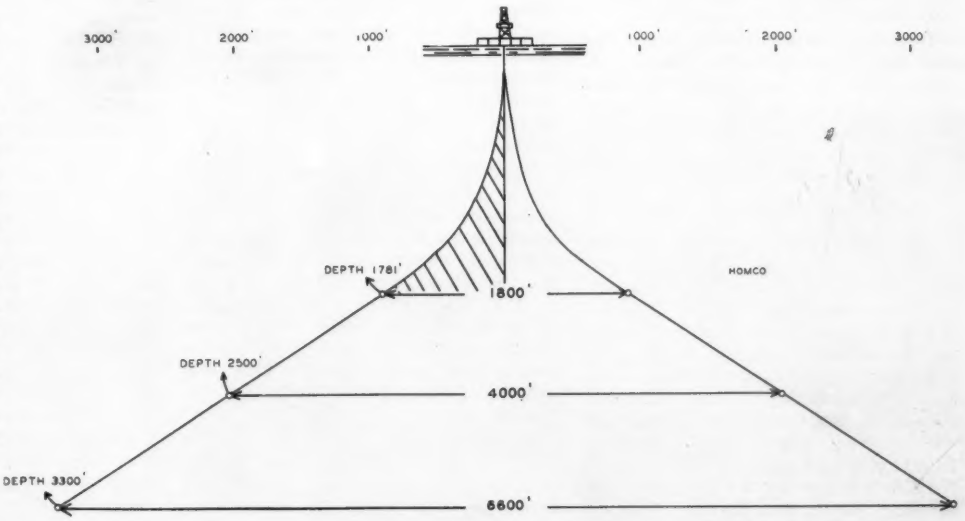
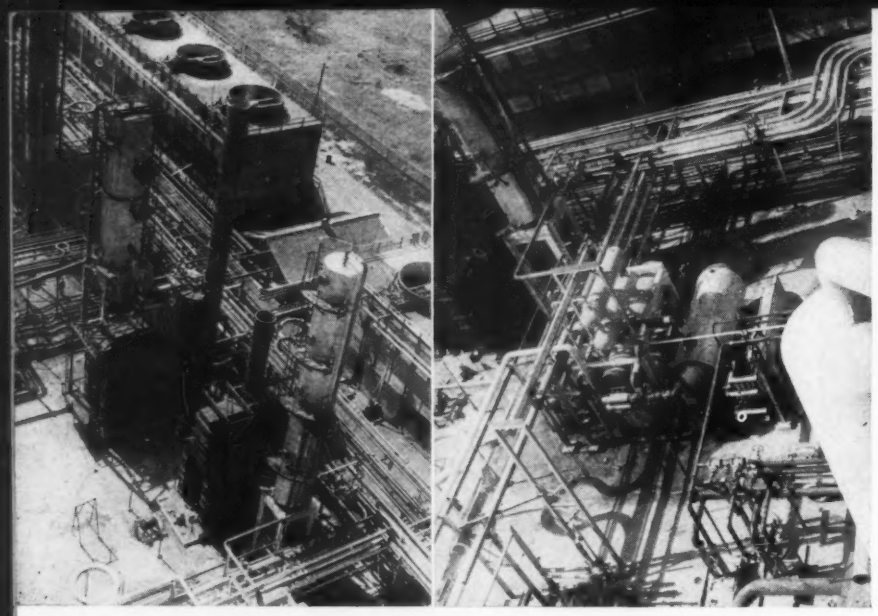


Fig. 3—Shaded section of diagram shows the vertical path of Magnolia's Well No. 2, Block 62, in the Gulf of Mexico, to a true depth of 1,781 ft., where the total deflection was 900 ft. With this deflection, any portion of a circle with an 1,800-ft. radius, 1,781 ft. below the surface, can be penetrated with a directionally controlled bit. A vertical plat prepared on this basis shows a rapidly diverging "cone of penetration." If the maximum angle attained were carried down to 2,500 ft., a circle of 4,000-ft. diameter is explorable.



Left: The visbreaker heater and tower are shown in foreground; in the center are the vacuum reduction unit consisting of heater and tower. The crude preflash tower appears at upper left. The vacuum unit receives hot reduced crude from the main crude tower bottom through the vacuum heater. An overhead gas oil cut of 5,220 bbl. per stream day and a bottoms pitch are pumped from the vacuum tower. The gas oil flows through heat exchangers and coolers to storage as charge for the cat-cracker. Pitch bottoms are transferred to the visbreaker heater and tower from which are removed 100 bbl. of gasoline and 1,700 bbl. of No. 6 fuel oil per stream day. Right: The crude vs. products exchangers are in center, the flow-down sump condenser at right, and one of the cooling towers in background

SUNRAY PROCESSES

20,000 Bbl. of Crude

DAILY IN

Converted Refinery

WHEN the war ended in 1945, the government-owned 100-octane gasoline plant of Associated Refineries, near Duncan, Okla., was shut down, like most of the other war plants, and doubt existed generally that it could ever be operated profitably under peacetime conditions.

That doubt has been dispelled. Today this refinery, having been purchased from the Government by Sunray Oil Corp., is daily processing about 20,000 bbl. of Oklahoma crude into a variety of products, after a remarkable reconversion job.

Original 100-Octane Unit

The Associated Refineries' wartime plant was strictly a 100-octane-gasoline operation. Principal elements were a two-stage, fluid catalytic cracking plant with a charging capacity of 12,000 bbl. of fresh feed per day, a gas-concentration system, a 2,500-bbl.-per-day hydrogen fluoride alkylation unit, a 300-bbl.-per-day isomerization plant, and a modern boiler plant. Production was about 250,000 bbl. per month of 100-octane gasoline during wartime.

Auxiliary equipment included three large forced-draft cooling towers, necessitated by the heavy water requirements of the alkylation plant. A plentiful source of water supply was assured by a pipe-line system, including pumping facilities, to Lake Duncan, about 8 miles away. Tankage included rundown, charging-stock, and product-storage tanks, among which were three 80,000-bbl. floating-roof gasoline tanks and a number of spheres for the storage of butane, isobutane and butylenes.

Buildings included an office building, a change house, warehouses, a well-equipped machine shop, a big pump house, electric substations, and a number of dwellings for key personnel. There was a large loading rack for tank cars and exceptionally complete facilities for loading and unloading trucks. The latter included a check house, equipment for steaming out truck tanks, and a well-equipped garage.

All these factors were on the credit side of the ledger as the Sunray management viewed the picture and considered the possibility of converting the plant into a profitable commercial refinery. Universal Oil Products Co. designed the original 100-octane installation, and performed the design on the new conversion project.

The purchase by Sunray was consummated in October 1947 and the reconversion project got under way at once. The problem was to transform the refinery to profitable commercial operation, making use of existing facilities to the fullest extent. General contractor was Refinery Engineering Co., Tulsa, which did all the construction work except that on the cat cracker.

New Pipe Lines Provided

The refinery possessed no pipe lines to afford cheap transportation for crude in and products out, inasmuch as it had been designed to operate exclusively on gas oil, which was delivered by truck from eight nearby refineries, and to produce aviation gasoline which was shipped out by tank car. Pipe lines were a necessary part of the reconversion project.

Sunray's original refinery, capacity 12,000 bbl. per day, is located at Allen, Okla., about 100 miles northeast of Duncan by pipe-line route. While the reconstruction work was in progress at the refinery, Sunray crews were busy laying an 8-in. products pipe line from Duncan to Allen for products exchange, and to storage at Allen. At the same time, a short line was being laid to bring crude from Velma field to the refinery. Additional crude-oil gathering lines are being laid to various fields in South Central Oklahoma. Three modern pipe-line pump stations and eight 80,000-bbl. storage tanks were constructed at Allen, Wynnewood, and Duncan. At Drumright, Sunray finished products are delivered to the Great Lakes Pipe Line system through 83-mile 8-in. line from Allen.

Needed for the new program was a topping unit and desalting equipment, a necessity for treating Velma crude, which is high in salt, sulfur,

and asphalt content. Furthermore, a vacuum unit was needed to recover the heavy, waxy gas oil from the topped crude, and a visbreaking operation was required to make a salable fuel oil from the heavy residue. There was no provision for treating the products of crude distillation.

As operated in wartime, the light gases from the cat cracker were charged to the alkylation unit to produce aviation alkylate. That procedure being considered no longer advantageous under the proposed new operating schedule, it was desirable to install a polymerization unit and a propane separation unit to prepare this product for the L.P.G. market. It was necessary to install additional tankage in connection with this operation.

New Cat Cracker Plan

The original cat cracker was built for two-stage operation, one stage for cracking fresh gas oil and the other for retreating the cracked gasoline. The two stages had a common regenerator but two reactors, two large fractionating columns, and separate auxiliaries, such as condenser boxes.

It was proposed to operate the cat cracker as a single-stage unit, which required extensive changes in both the reactor and regenerator sections. The large feed heater was not necessary for this operation, so this heater and the retreat fractionating column were taken as basic elements for a new topping unit.

In order to increase the crude capacity of the converted plant it was decided to preflash the crude. To accomplish this, a heat exchanger from the alkylation unit and the debutanizer tower from the gas concentration system were combined into a preflashing plant. By this scheme about 15 per cent of light straightrun gasoline is flashed off when the charge to the crude unit is preheated to about 400° F. The improvised crude unit and the preflashing system give the plant its 20,000-bbl.-per day crude capacity.

A large settler from the alkylation unit was converted into a vacuum unit, with the addition of a small heater and necessary auxiliaries.

A poly unit was built to handle the gases from the crude unit and the cat cracker. A propane unit also was installed. These were constructed by the utilization of equipment on the ground, with the exception of the poly-unit reactors and the propane-storage tanks, which were bought new. Treating equipment for the various products was likewise built.

Actual construction work was begun in October 1947 and proceeded on a carefully worked-out schedule. On December 5, the desalter and crude unit went into operation. In the meantime, construction of additional storage had been going ahead so that sufficient tanks were completed to store the products which were to be further processed when the necessary elements of the plant became ready.

Construction of the vacuum unit had been so timed as to have it ready for operation before the accumulated stocks of topped crude from the operation of the crude unit became too great. All the light products from the crude unit were immediately made salable, the necessary treating facilities having been provided in advance.

Using one of the existing towers, the straightrun gasoline was stabilized to remove propane and lighter fractions, including hydrogen sulfide. The vacuum unit flashed off gas oil as charge for the cat cracker, leaving heavy asphaltic bottoms of high viscosity.

In order to render this rapidly accumulating material salable and dispose of it before the storage tanks were filled, the next two moves were to get the visbreaker into operation to reduce the viscosity of the vacuum bottoms, and to start up the cat cracker which would produce low-viscosity material for blending.

While work on the cat cracker proceeded, the gas-concentration system was being remodeled to separate the large quantities of propane, propylene, butanes, and butylenes which the cat cracker would produce, and the poly unit was being constructed to convert these fractions into polymer gasoline. The timing was accurate. Both the gas-concentration system and the poly plant were ready when the cat cracker went on stream.

Fractionating equipment was installed to separate butane from the poly unit's effluent gases, and this butane, stored in the spheres, is used for blending with gasoline from the Allen and Duncan plants to control vapor pressures.

Equipment was installed for separating, liquefying, treating, and drying the propane, which is then stored in new propane-storage tanks.

Treating facilities for poly feed and product were ready on schedule.

Increasing its production step by step, the plant has been in full operation for nearly a year now, demonstrating how a refinery, designed exclusively for war production, can be converted to peacetime operation.

THEY PLANNED CONVERSION

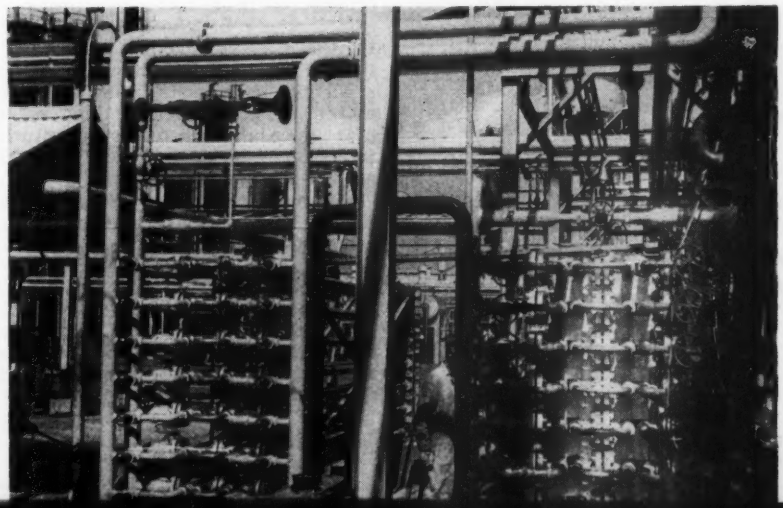
R. L. JOHNSON

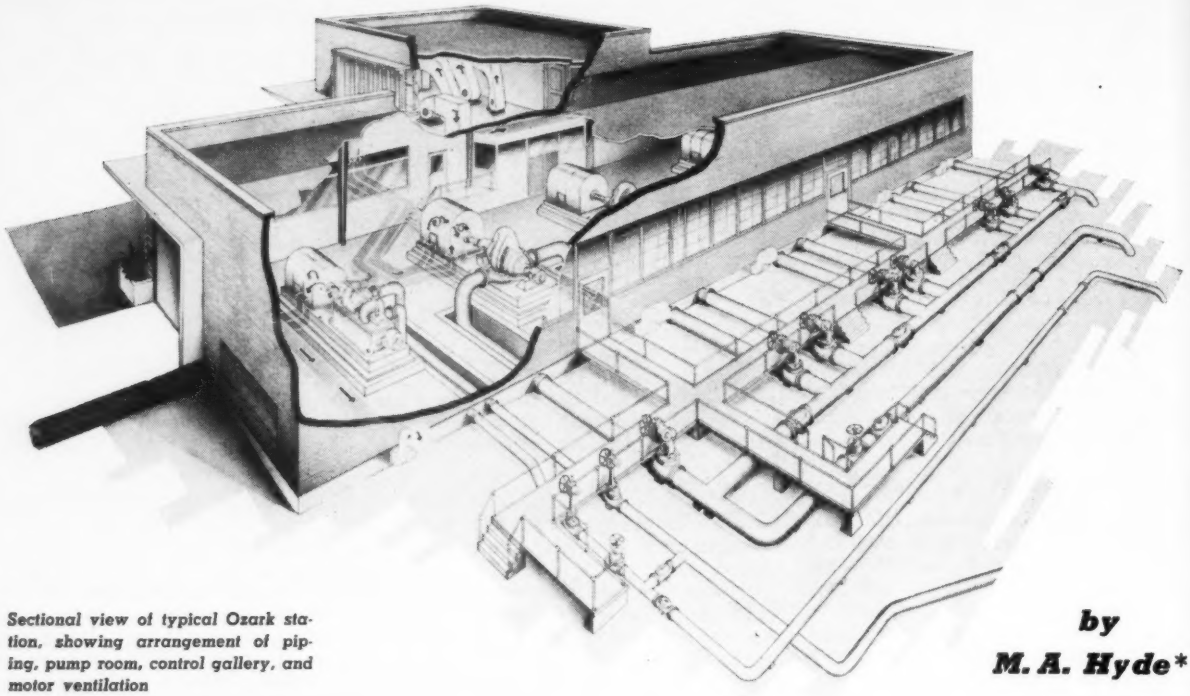
F. L. MARTIN

C. H. WRIGHT

Here are three Sunray men who planned the conversion of the former 100-octane plant at Duncan, Okla., into a refining operation linked via a 100-mile pipe line with the company's other refinery at Allen, Okla. Johnson is manager of the Duncan refinery, Martin is executive vice president at Tulsa, and Wright is president at Tulsa.

Heat exchangers and coolers in Sunray's poly plant transfer heat from the reactors' effluent products to the fresh charge. Bypass valves provide means whereby individual units may be cut from the system for cleaning





Sectional view of typical Ozark station, showing arrangement of piping, pump room, control gallery, and motor ventilation

by
M. A. Hyde*

Advanced Station Design Enhances

Flexibility in Ozark Big Inch

THE new Ozark crude line, now under construction by Shell Pipe Line Corp. as a joint project with Texas Pipe Line Co., is a 22-in. line which will operate from Cushing, Okla., to Wood River, Ill., a distance of 435 miles, and will extend under Texas ownership an additional 54 miles to Patoka, Ill. Six pumping stations are being installed for a capacity of 187,000 bbl. per day.

The first five stations will also serve a separate 10-in. line from Cushing to Wood River, carrying 28,000 bbl. per day, wholly owned by Shell. This 10-in. line and an older parallel 10-in. line to be abandoned, have been operated previously by diesel engines.

Each station wil contain three 1,250-hp. 1,800-r.p.m. units and one 600-hp. 1,800-r.p.m. unit for the 22-in. line. For the 10-in. line a single 700-hp. 3,600-r.p.m. unit will be installed in each of the first five stations, with a duplicate spare unit at Cushing.

The Ozark 22-in. crude line is a good example of the flexibility provided by constant-speed units in stepped-pressure arrangement. The three two-stage units in each station will develop approximately 240 psi. under design flow conditions, giving a combined pump pressure of 720 psi. for the three units in series. With a station suction pressure of 20 psi. the discharge pressure will be 740 psi. The additional single-stage unit will develop approximately 120 psi.

Design throughput of the line will be attained with all stations operating three full-head units. For lower throughputs the station pressure can be reduced in six steps by operating combinations of the full-head and half-head units. Ability to increase the station head by one-sixth or to reduce it in steps of one-sixth also makes possible corresponding steps of compensation in station pressure for changes in viscosity and specific gravity of the line content.

Fig. 1 is a sectional view of the station from the rear or manifold side. From a louvered penthouse above the front portion of the building a blower delivers filtered air through an individual duct to each pump motor. Air enters the front and rear ends of the motor, through the bedplate. Passing through the motor, the air is discharged through the bottom of the motor frame at the center, to an outgoing duct which runs underfloor to a point outside at the rear of the building.

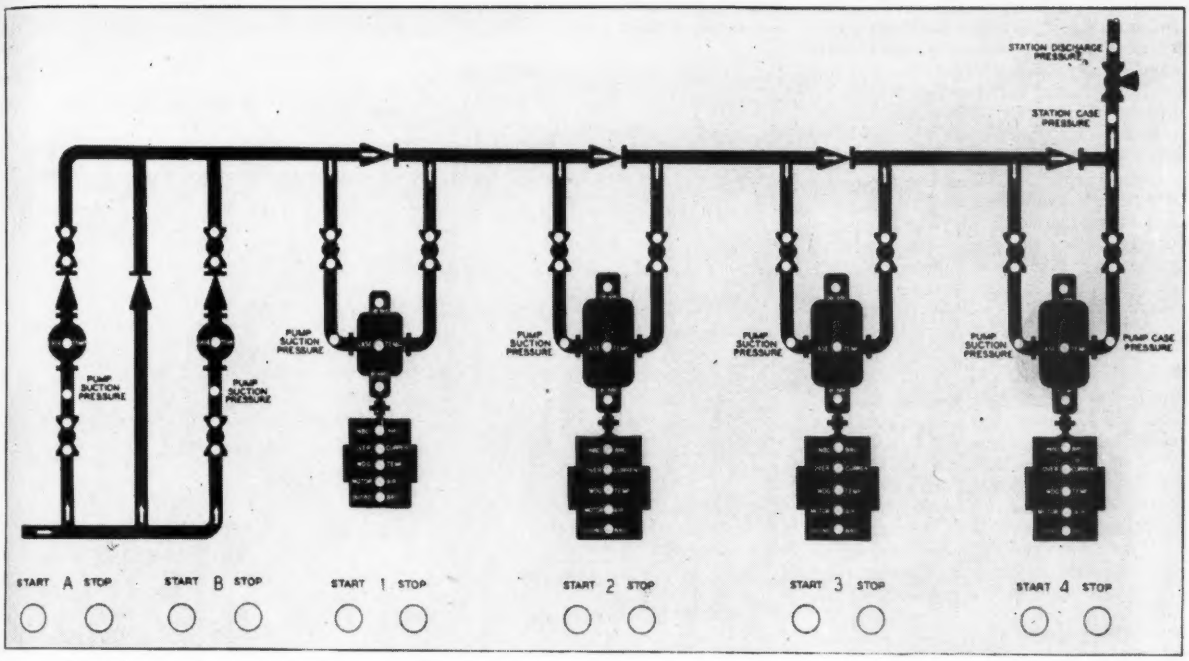
The pump motor has sufficient blower effect in its rotor to supply the pressure drop through the unit; the external blower supplies the pressure drop through the duct system. At the discharge end of the duct is a vane-operated relay, which will stop the motor and prevent its being started in the absence of air flow. The motor control is arranged to purge the duct system for a timed interval before the unit is started.

These motors are equipped with bearing temperature relays and winding temperature exploring coils. All connections to the bearing and winding protective elements as well as the power connections to the motor windings are made inside the motor housing, via conduits entering through the bedplate—no external conduit connections to clutter up the installation.

Motor-Starting Equipment

In determining the starting equipment to be used for main-line pump motors, the principal factors are (1)

*Westinghouse Electric Corp., East Pittsburgh, Pa. Material from recent annual meeting of Petroleum Power Association, Oklahoma City.



Control desk top for Ozark 22-in. line, No. 1 station at Cushing, Okla.

the size of the units, (2) whether they will be started on full voltage or reduced voltage, (3) required interrupting capacity, and (4) the location of the starters with respect to the hazardous areas.

Unit size and method of starting should receive consideration in the determination of the number of pump units per station. Within economic limits, subdivision of the station capacity into a number of units is advantageous, not only for flexibility in line operation but also because it improves power service conditions by reducing the motor-starting demand in relation to the running load. This may mean the difference between use of full-voltage starting or the more complicated and expensive reduced-voltage starting equipment.

In arranging power service, every consideration should be given to the use of full-voltage starting as an economy in electrical equipment. Since the service is usually through transformers carrying no other load, and the starts are very infrequent, it is feasible to use full-voltage starting in a remarkably large percentage of cases. On the Shell Ozark system all motors will be started full voltage except the 1,250-hp. motors in two of the six stations.

It is advantageous to standardize on equipment throughout the line, so the interrupting rating is usually determined by the maximum requirement at any station site. This may justify use at the limiting station or stations of transformers having higher than normal impedance.

Motor-starting equipment is available at interrupting capacity levels of 25,000, 50,000, 100,000, 150,000 kva., and higher. The interrupting requirement for a station having as large as 5,000-hp. running load, if served through an individual transformer substation, ordinarily will not exceed 100,000 kva.

Motor-starting equipment may utilize contactors, or contactors in combination with current limiting fuses, or circuit breakers, as determined by the motor horsepower rating, the interrupting requirement, and the grade of service performance to be realized.

For trunk-line service there is a growing trend to the use of circuit breakers in unitized metal-clad switchgear. While this equipment is highest in first cost, it has some important advantages for pipe-line operation. The circuit breaker, operating relatively infrequently, requires a minimum of maintenance. This is particularly true of air circuit breakers. The low maintenance requirement may be attributed at least in part to the fact that the circuit breaker does not drop out on momentary voltage dips and then reclose with a heavy current surge to the motor, as does a contactor with time-delay undervoltage relaying.

Maintenance Is Simplified

The circuit breaker eliminates the need of fuses with the attendant problems of replacement stocking and possibility of single-phase operation. With removable breakers and an interchangeable spare breaker, maintenance work on the breaker units is performed with minimum down time, and in the event of breaker trouble the spare provides insurance against a prolonged outage. The removable breaker provides a disconnecting means of the safest type. In fact metal-clad switchgear provides the ultimate in safety to both the operating and the electrical maintenance personnel.

The Shell Ozark project is an example of having the switchgear located in a separate room with pressurized ventilation from the blower room (Fig. 1). Should failure occur in ventilating air flow to the switchgear room, a vane switch in the air duct will notify the operator by sounding the station alarm and lighting an indicating lamp on the station control desk. The operating room, where the station control desk is located, is similarly ventilated.

In the event of an emergency involving possibility of the entrance of hazardous atmosphere to the operating room or to the switchgear room, by means of an explosionproof emergency pushbutton at the control desk or a similar pushbutton on the switchgear, the operator can safely trip the main breaker feeding the station. This breaker is located at the transformer substation.

The main pump motor control is metal-clad switchgear, 4,160 volts, with air circuit breakers of 100,000 kva. interrupting capacity. The switchgear includes bus surge protection for the motors.

Each main pump unit is provided with time delay undervoltage protection, also short-circuit, locked rotor, single phase and thermal overload protection. A temperature relay actuated by an exploring coil in the motor stator warns the operator in case of overtemperature in the windings, as might occur in event of in-

adequate ventilation. The switchgear includes a temperature indicator with transfer switches whereby the motor-winding temperatures at the various exploring coils can be selectively indicated. This permits a check on the adequacy of ventilation for the load being carried on each main motor.

Beside the motor-bearing-temperature relays previously mentioned, each unit is protected by similar temperature relays in the pump bearings and pump case, also by low pump suction pressure and high pump case pressure relays. Excessive pressure on the pump side of the station throttling valve will actuate a relay to shut down Unit 1 or Unit 2, or both if operating.

A high station discharge-pressure relay will shut down all units in event of excessive pressure on the line side of the throttling valve. These relays are of the Mercoid type, in explosionproof housings, mounted in cabinets in the pump room. Each cabinet includes a run-stop pushbutton permitting the unit to be shut down and locked out (but not restarted) from the pump room. Each Mercoid cabinet is factor assembled, wired to terminal junction boxes near the base, from which sealed conduits will run to the switchgear.

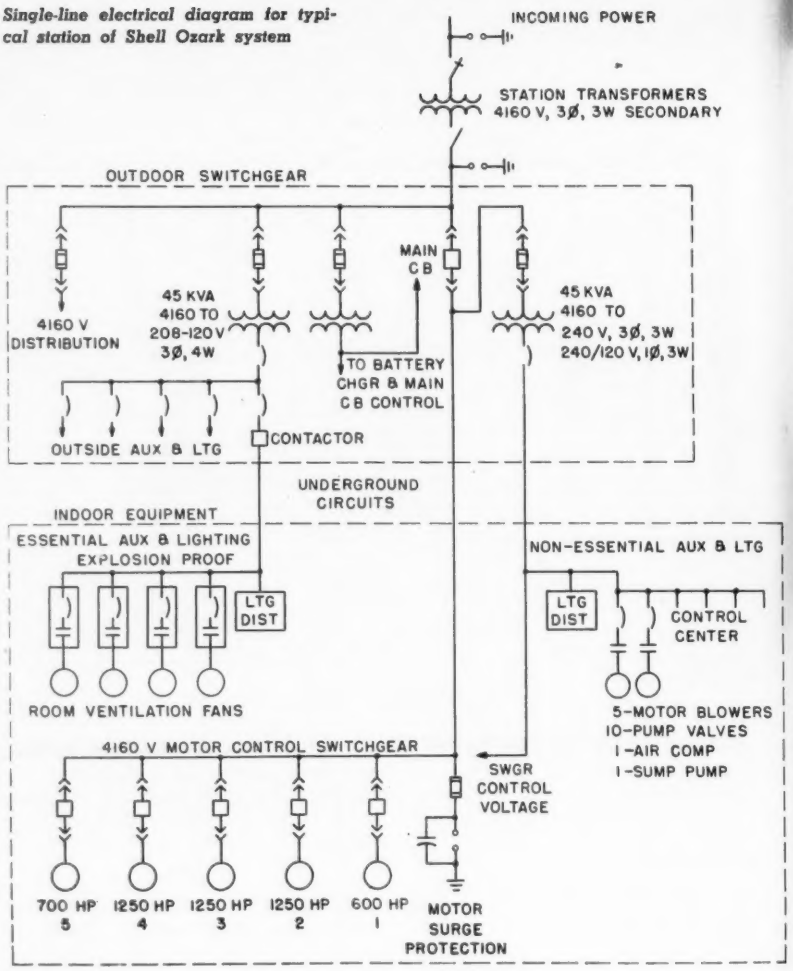
A coordinated control system for each pump unit combines the motor switchgear with the controls for the pump suction valve, discharge valve, and venting valve, also the motor-ventilating blower and the protective relay cabinet.

Sequence of Operations

When the station operator desires to start a unit, he merely pushes the start button for that unit and the following operations occur, in sequence:

1. The ventilating motor starts.
2. The vane switch at the duct discharge checks the flow of air through the motor ventilating system. If vane switch responds to air flow.
3. A timing relay provides an interval of blower operation for purging the duct system.
4. Simultaneously with (1) the motor-operated pump suction valve begins to open, and
5. The pump casing is vented by opening a vent valve to the station sump.
6. At the end of the purging interval the pump vent valve is closed, and, if the suction pressure is above predetermined minimum and the air vane switch registers air flow,
7. The pump starts. When this occurs
8. The motor-operated pump discharge valve opens, completing the starting sequence.
9. The sequence of starting operations is checked and if completed within the prescribed time the unit proceeds in operation, otherwise it is stopped. After the starting sequence is completed any deviation of the suction or the discharge valve from the fully open position will shut the unit down.

Single-line electrical diagram for typical station of Shell Ozark system



To stop the unit, the attendant pushes the stop button, whereupon:

1. The motor circuit breaker opens to stop the pump.
2. The pump suction valve closes and simultaneously
3. The pump discharge valve closes.

The same shutdown sequence occurs upon functioning of any of the automatic protective devices. In case of stoppage by power failure the valves will close upon resumption of power.

The pushbuttons are located on an electrical control desk in the operating room, overlooking the pump room. Separate consoles are provided for the 22-in. line and the 10-in. line, with a horizontal writing space between the two console sections, where the station log sheets are kept. Fig. 2 is the console top design for the 22-in. line at Cushing Station No. 1, showing the schematic layout of two suction booster pumps and four main units. The 10-in. line console is similar.

The control consoles are equipped with green and amber indicating lights to show the position of each pump suction and discharge valve. Red indicating lights, in conjunction with the audible station alarm, identify the several unit protective functions already mentioned, also high level in the sump which receives drainage from the pump vents and glands, low air pressure to pneumatic controls, and low air supply to the switchgear and operating rooms. Green and amber indicating lights supervise the two exhausters which maintain ventilation of the pump room.

An alarm reset button is pushed to silence the alarm, and this extinguishes the corresponding red indicating lamp if the abnormal condition has ceased.

Facing the control consoles, a vertical gage panel, gas tight, is set flush in the wall between the operating room and the pump room. This panel mounts several pressure gages which are connected to critical points in the station piping.

Recording presure controllers set flush in the wall at the ends of the control desk provide pneumatic control of the throttling valve for each line.

Power Circuit Layout

In the Ozark stations, the principal station load is fed through a main

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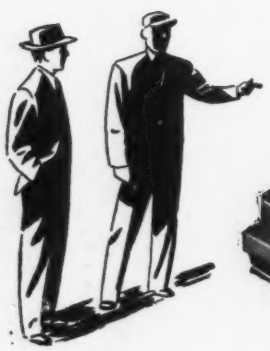

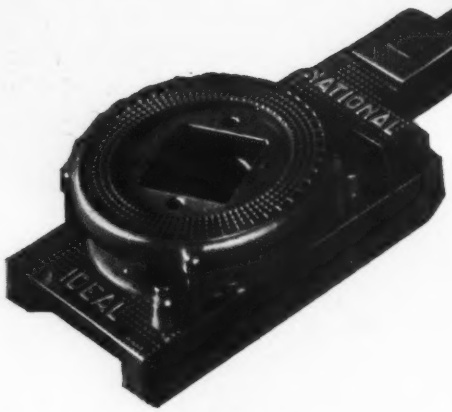

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125	12,500 ft — 4½" D.P.
160	16,000 ft — 5" D.P.
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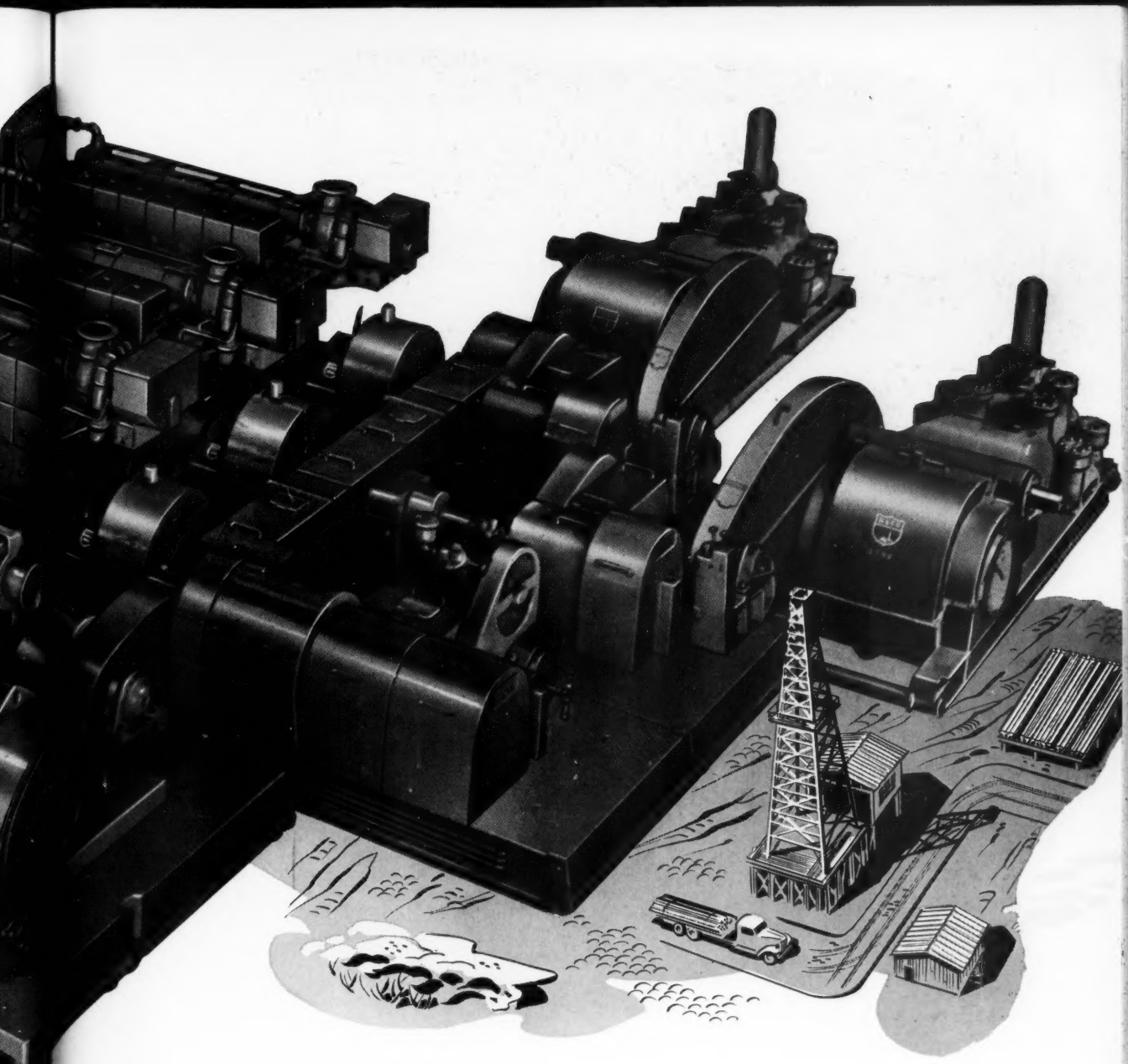

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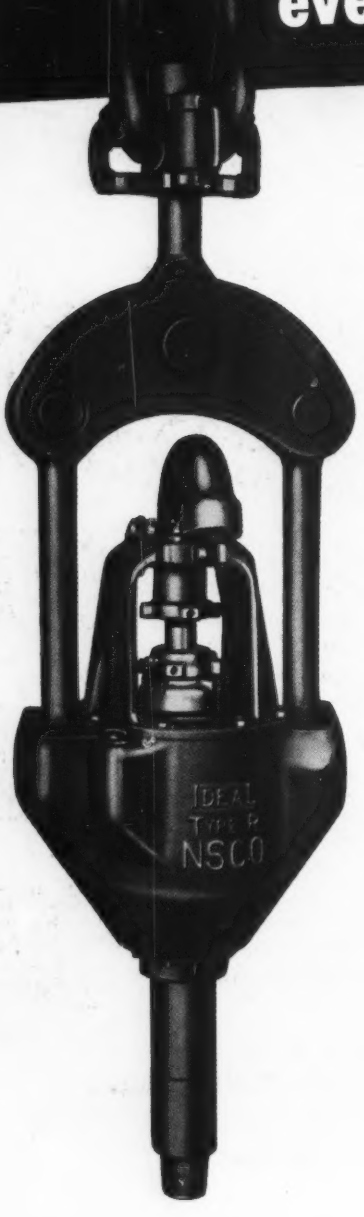

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Height Overall	48″	5′5″	7′8″	8′0″	9′7″	10′11¼″	11′9¾″
Width, Overall	21″	23″	30″	33½″	38″	38″	44″
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breaker located at the transformer substation, as shown in the single-line electrical diagram Fig. 3. The main breaker relaying includes overcurrent, phase failure, phase reversal, and phase balance protection.

The 4,160-volt circuit to the pump motor bus is tapped to a transformer serving the "nonessential" lighting and auxiliaries, which are thereby interrupted when the main breaker is opened. Devices on this circuit may or may not be designed for hazardous atmosphere, depending upon their location. A conventional control center installed in the switchgear room includes the reversing controllers for the motor-operated valves, and starters for the main pump-motor blowers, the air compressor, and the sump pump.

Opening the main breaker kills all circuits within the station except a so-called "essential" circuit carrying the room ventilating fans and certain lighting. On this circuit all devices and wiring within the station are explosionproof. Operation of the emergency pushbutton also clears the "essential" circuit through a contactor at the substation, but this contactor can be reclosed from a separate pushbutton to permit the room ventilating fans to run and to energize the essential lighting, at the operator's discretion.

The main breaker, and the auxiliary power and lighting transformers with drawout primary fuses, are mounted in outdoor metal-clad switchgear at the transformer substation. The main breaker is interchangeable with the indoor motor breakers, permitting a single spare breaker to serve all 4,160-volt breaker units. All circuits from the outdoor switchgear to the pump station building are underground.

Simplified Operation by Electrical Control

The salient feature of these modern installations is simplified operating procedure. This means reliability in maintaining operating schedules, an all-important factor in pipe-line economy. The old method of starting or stopping a pump unit requires the operators to engage in a series of separate manual procedures in different parts of the station, including hand operation of valves—a task that becomes quite laborious in big-inch sizes. With centralized pushbutton control, an attendant in the control room—where he has continuous contact with the line dispatcher—initiates the control sequence and then supervises the automatic performance of the necessary steps for starting or for shutting down the completely coordinated pump unit.

If desired the procedures of starting and stopping the pump units could be carried out under automatic control or remote supervisory control—in fact such installations have been made years ago. Many feeder and branch lines are well adapted to automatic or supervisory control. However, on trunk lines there is still need for high-grade personnel at the stations to stand watch and to carry out certain auxiliary functions such as running scrapers and reporting tender changes.

Now, what about the cost of these modern semiautomatic stations? Well, the over-all cost of the Ozark system that we have been discussing along with the 10-in. Shell line, including the value of the existing 10-in. pipe line as utilized in the project, will be approximately 36 million dollars. Of this, electrical equipment, including the power transformers at the station sites, switchgear, motor control, motors, ventilating apparatus, valve operators, protective temperature and pressure relays, and electrical facilities for flow control at the tankage at each end of the line, plus installation expense for all these items, will total about 1½ million dollars, or about 4 per cent of the total project.

Suppose as an economy measure it were decided to install in these stations manually operated valves and no centralized control for the pump units. This would effect a saving of perhaps $200,000 in station valve operators and electrical control apparatus installed, slightly over ½ of 1 per cent of the project cost. This is an appreciable item, but its value is small compared to the results to be obtained in the efficient operation of the system at maximum throughput.

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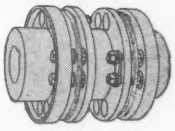

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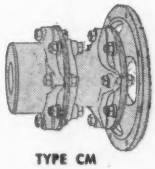

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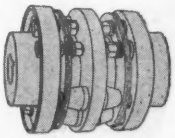

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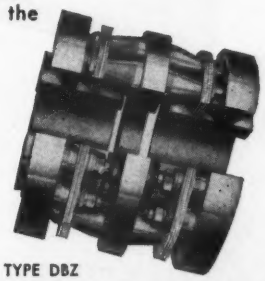

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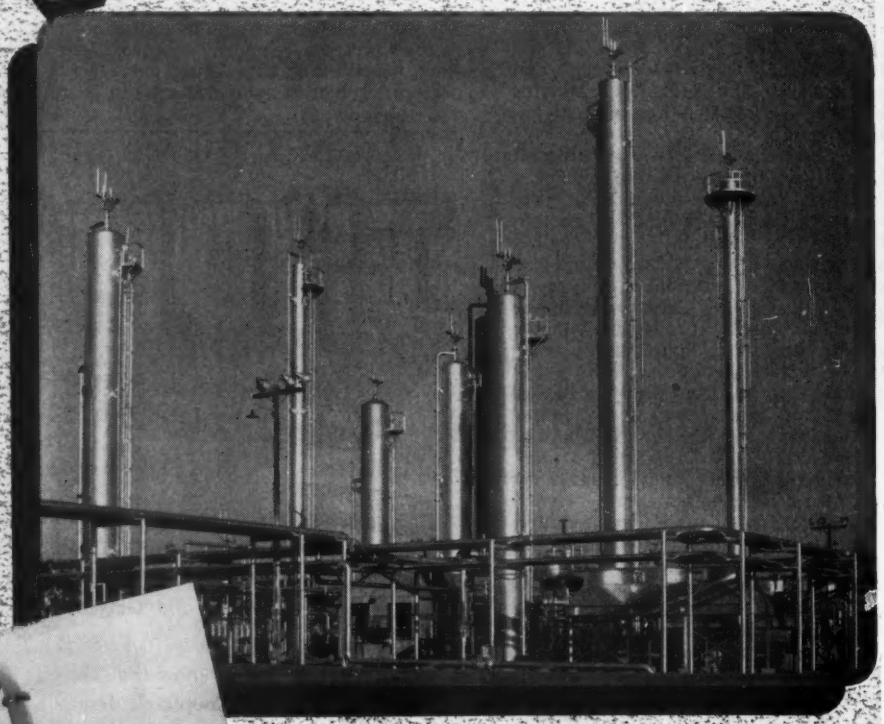

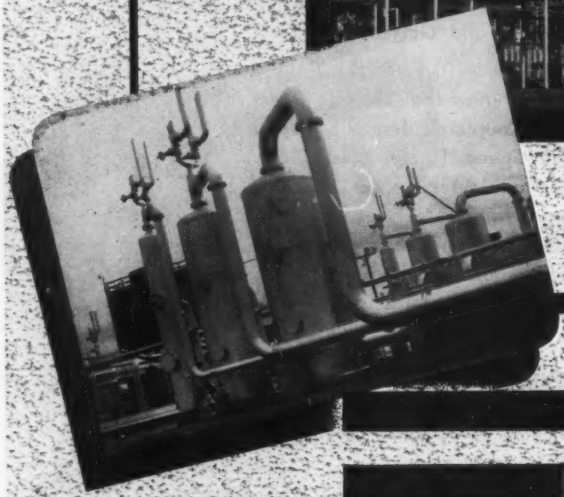

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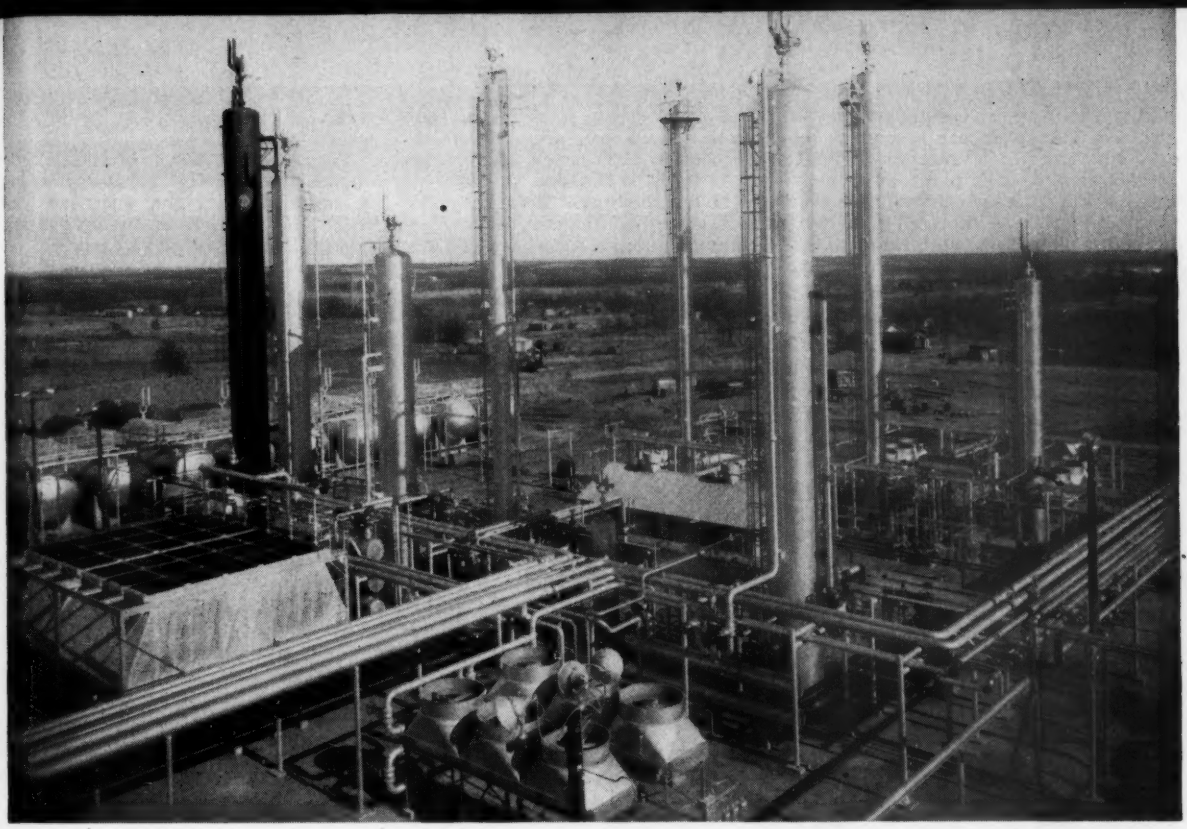

View of the general processing area in Skelly's Velma plant. The building between the two rows of columns houses the control equipment for both natural gasoline and L.P.G. extraction processes. Part of the equipment for air cooling may be seen in the foreground. Specifications call for 80 per cent of all cooling operations to be handled in equipment of this general type

New Natural-Gasoline Plant

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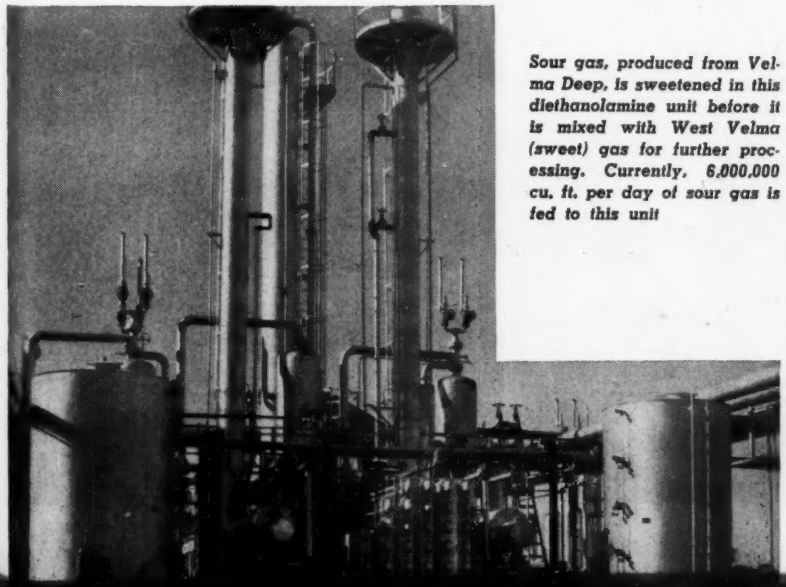
. . EMPLOYS AIR COOLING

. . HAS CENTRALIZED CONTROL

by R. B. Tuttle



Sour gas, produced from Velma Deep, is sweetened in this diethanolamine unit before it is mixed with West Velma (sweet) gas for further processing. Currently, 6,000,000 cu. ft. per day of sour gas is fed to this unit

UNUSUAL operational features distinguish Skelly Oil Co.'s new natural-gasoline plant at Velma, Okla. Foremost of the features incorporated into the plant design is for its operation without steam. Next, the design specified air cooling for 80 per cent of all cooling operations. And last, a variety of features including centralized control contribute further to placing the plant in the group of efficient new gas-processing installations.

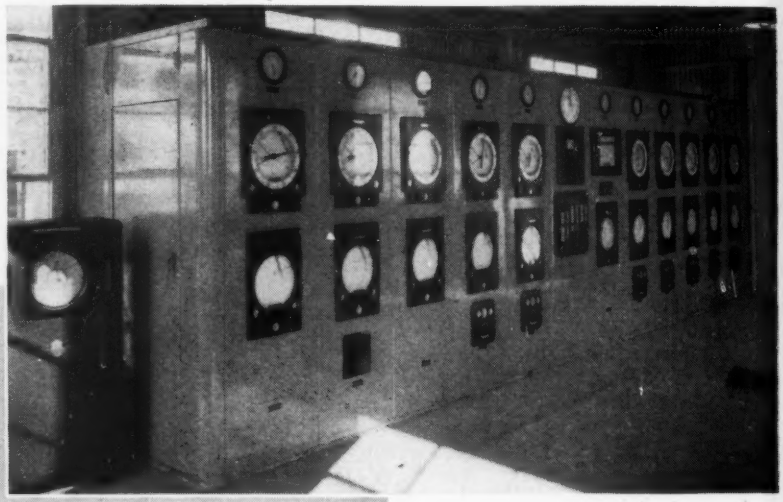
The plant processes two types of natural gas, sour and sweet. Volumetric ratio of these two types of gas as processed in the new plant is 3 to 13 with sweet gas at the higher figure. On a design basis the total processing capacity is 32 M.M.c.f. per day. Currently, 6,000,000 cu. ft. of sour gas is processed per day. The sour gas after being treated in a diethanolamine unit

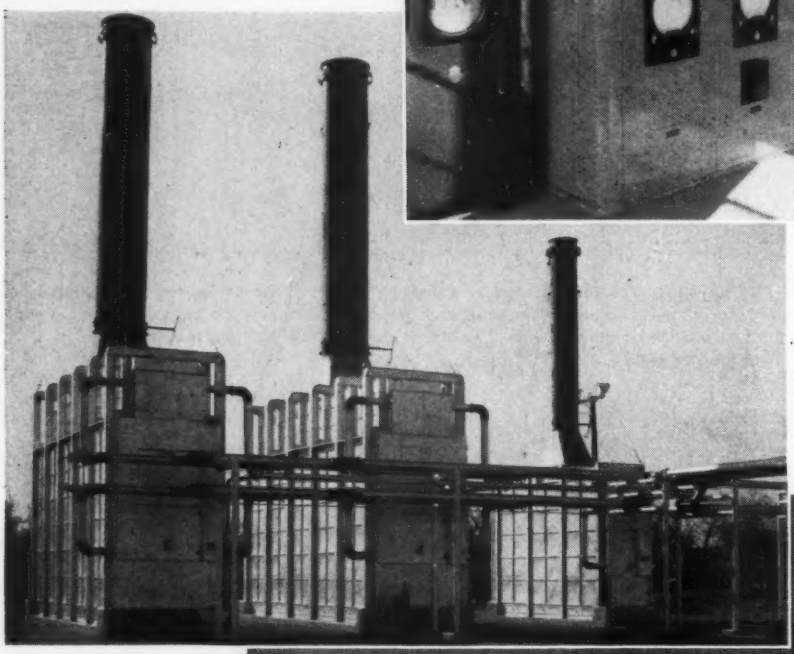
is mixed with the sweet gas for process feed. The sweet gas is a product of Velma and West Velma pools and is delivered to the plant at 5 psi. average line pressure. It requires no treatment prior to processing in the extraction plant along with the treated sour gas. Line pressure on the sour gas as delivered at the plant averages 60 psi.

The 26-70 gasoline content of the sour gas (Velma Deep) is in the range of 0.45-0.50 gal. per M. cu. ft. Field tests of the West Velma gas run 0.30-0.50 g.p.m. Gas produced from the Pennsylvania formations in Velma pool shows a wide variation from well to well, running from 0.50 to 1.00.

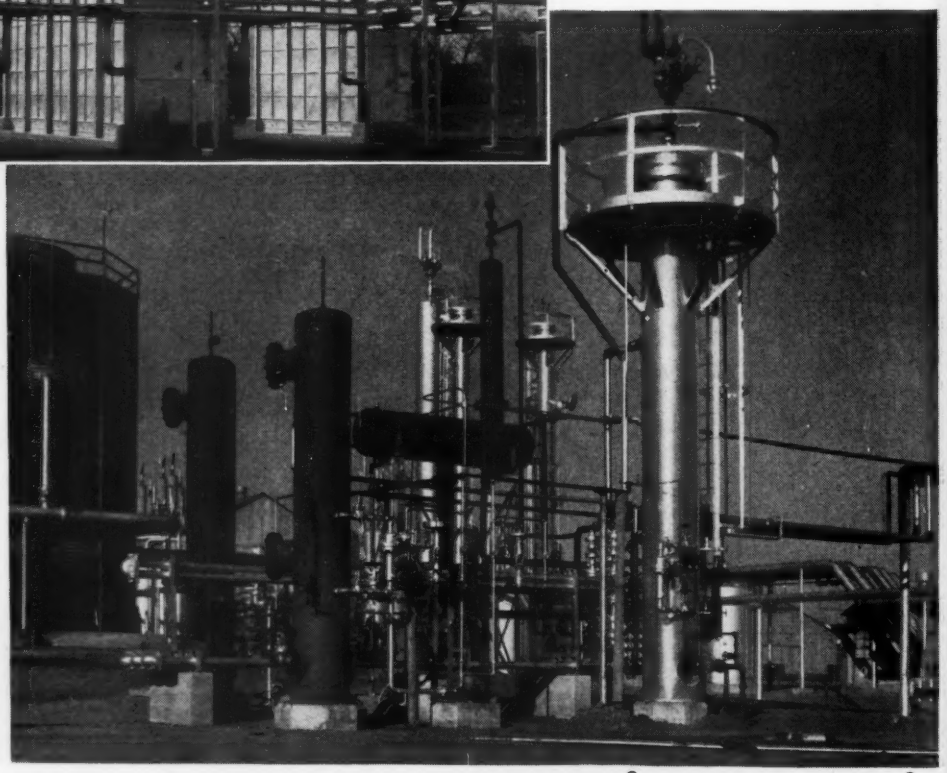
For processing in the extraction section of the plant the mixture of sweet and treated sour gas is compressed to 195 psi. pressure on the absorbers. A third stage of compression is used in boosting pressure on the unabsorbed gas. This gas after dehydration is delivered into lines of Oklahoma Natural Gas Co. All three stages of compression are handled by 600-hp. units.

The fuel gas for the compressor engines and for other plant operations is supplied from the overhead gas from the reabsorber, reciprocating pumps (this service will be described





Above: This control board, housed in the main control building, is the control center for all operations in the processing section. A similar but smaller instrument panel is provided in a separate building for control of dehydration and sweetening operations



Above: Capacity of the two Born Up-Flo fired heaters on the left is 68,000,000 B.t.u. per hour, each. The smaller heater on the right is the same type as the large units and operates to supply 8,000,000 B.t.u. per hour to the plant's reboilers
Right: The unit in the foreground of this view of a section of the Velma plant is an absorption oil purifier. A slip stream from the main oil circuit is processed in the unit and then delivered to storage for reuse

another important project

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The Velma Plant of the Skelly Oil Company has several unique features which serve to simplify operations and reduce construction and operating costs.

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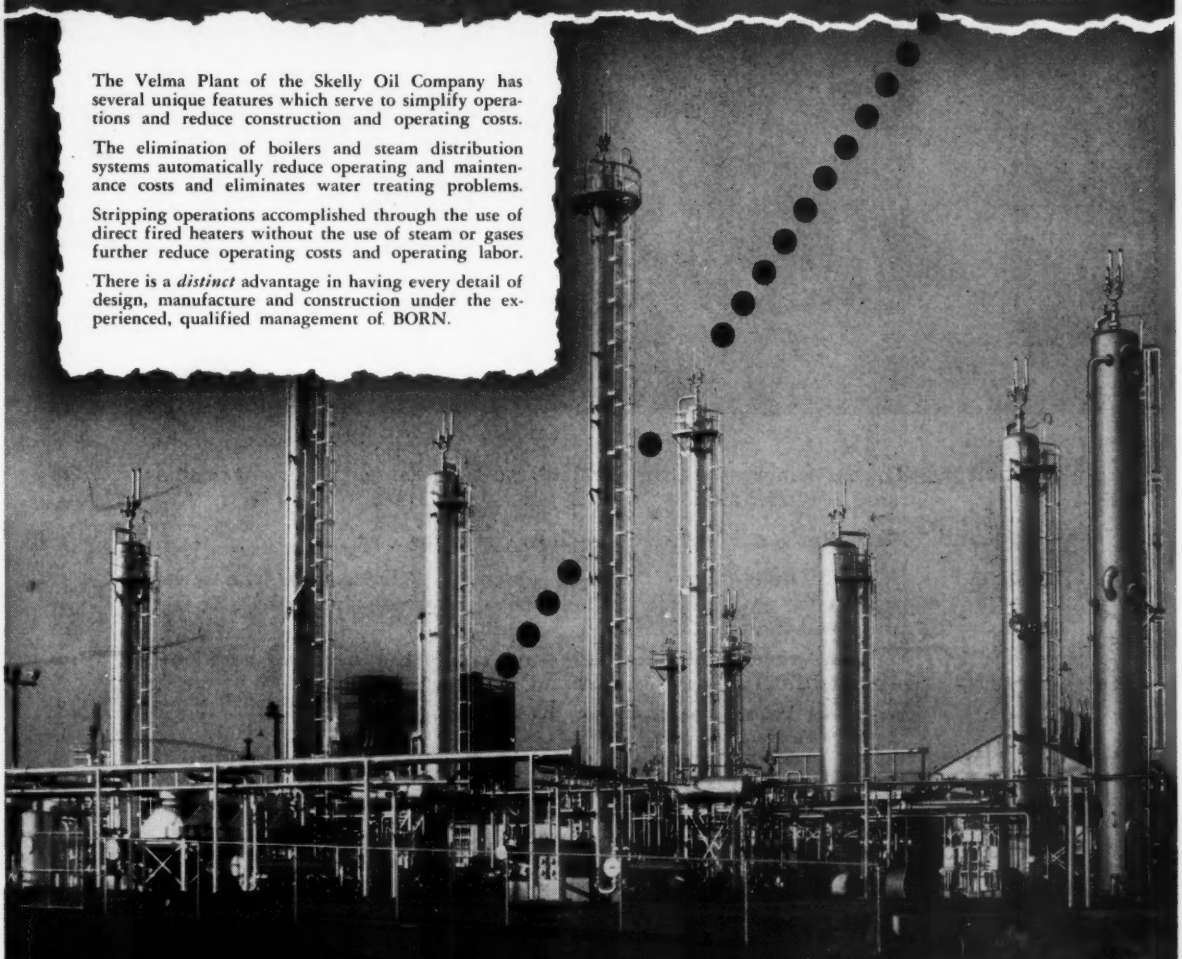

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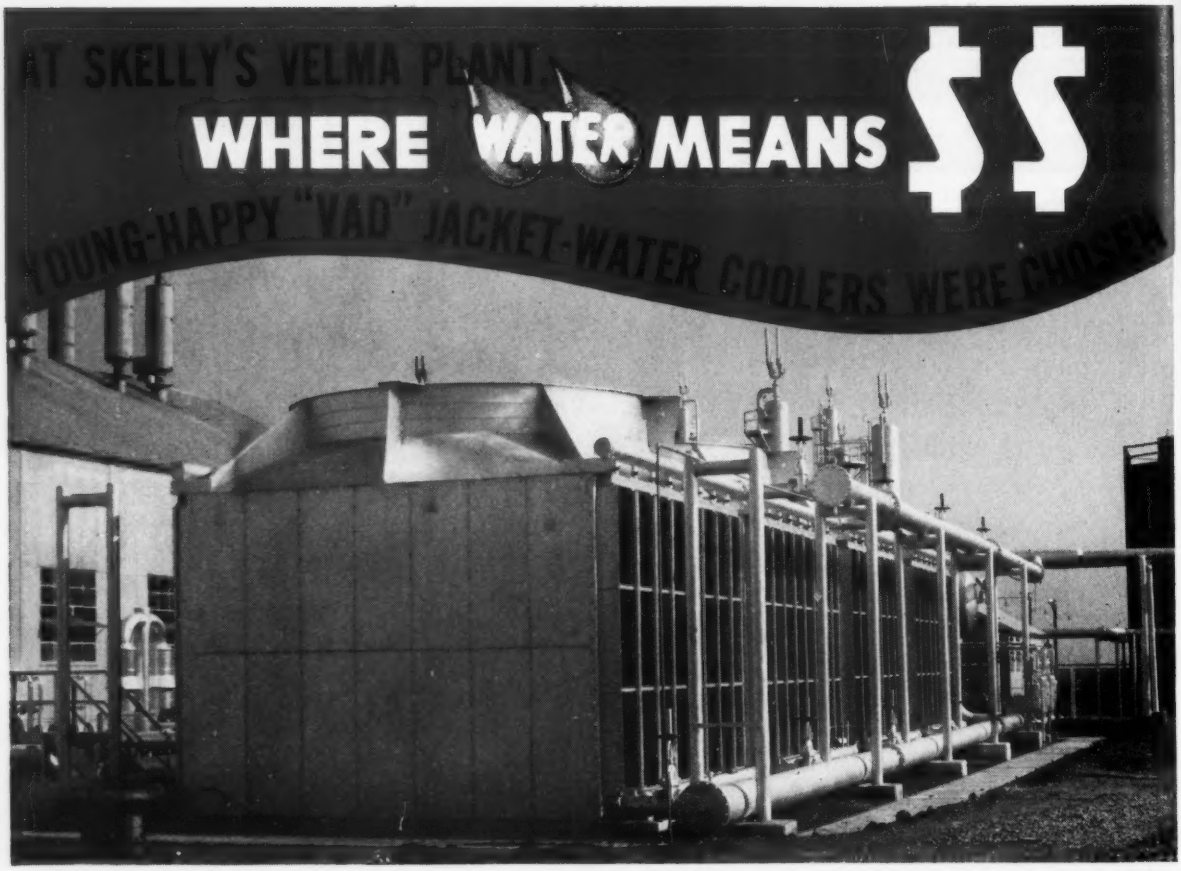
Canadian Associates: CANADIAN BROWN STEEL TANK CO., LTD., Brandon, Manitoba



Problem: To cool compressor engines rated *7200 HP* total and generator engines rated *1480 HP* total

Required: Minimum water "make-up" — Low operating cost

Solution: FOUR Young-Happy VAD-16 units for "air" cooling the jacket water, each with a 16 ft. dia. adjustable pitch fan driven by a 25 HP two-speed motor.

With two-speed motors on four fans, *nine* different speed points are provided to give *low* "year-'round" fan horsepower.

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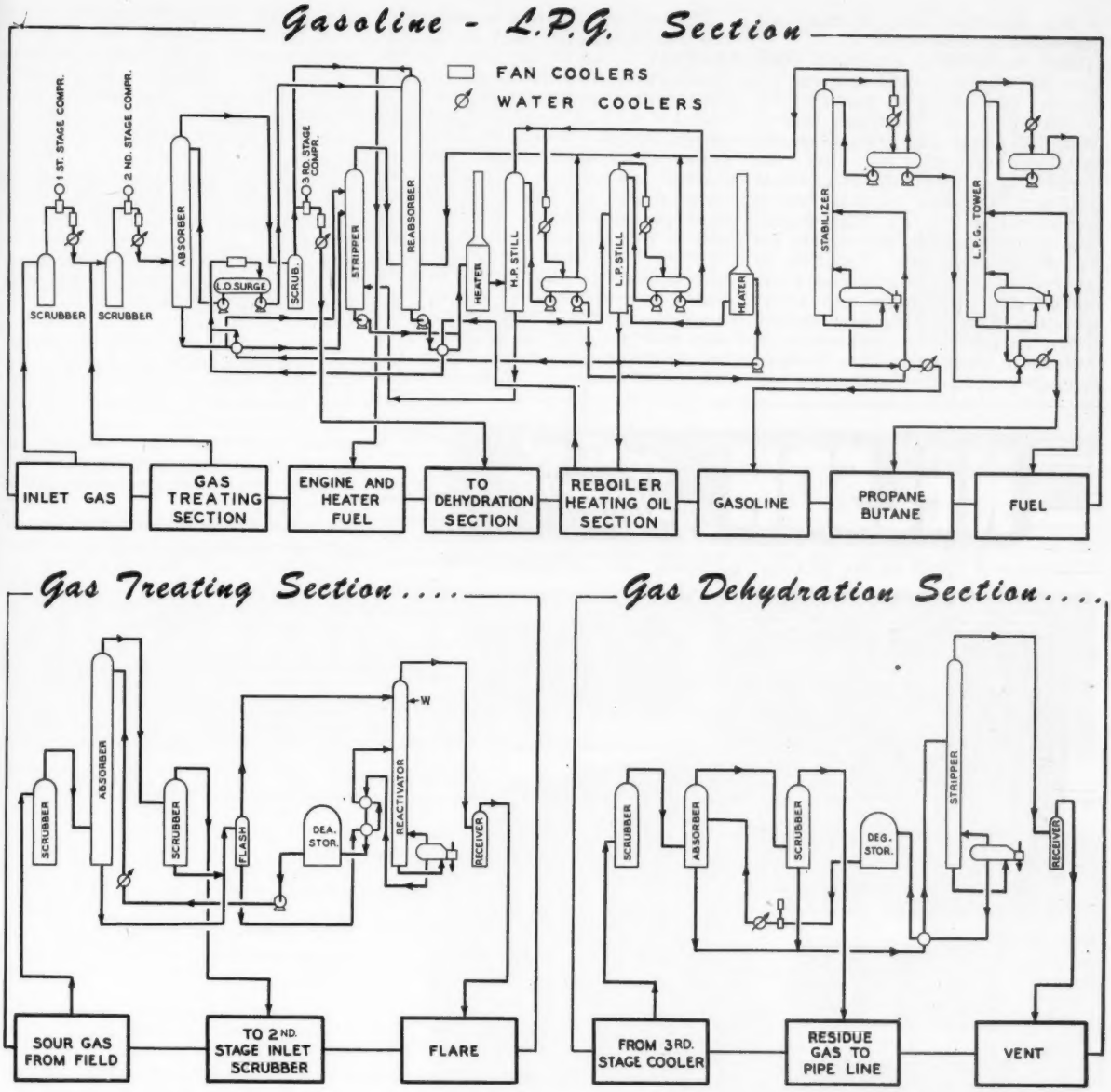


later), and a stream of gas from the main absorber is used to supply the difference and to hold a constant pressure on the residue system at 40 lb.

Fuel gas to the various processing operations in the plant is distributed approximately 44 per cent to heating and 56 per cent to power. The fuel gas utilized as power is split up between gas compression and electrical-current generation with about 16.5 per cent going to the last operation.

Net heat input to process is 68,000,000 B.t.u. per hour on a design basis. Direct-fired heaters, Born Up-Flo units, supply all heat for plant operation. To provide flexibility two heaters operate in parallel on the rich-oil stream. These heaters, rated at 30 million B.t.u. per hour each, automatically maintain temperature of the rich-oil stream within very small limits.

A third heater rated 8 million B.t.u. per hour of the same type as the rich-oil units supplies all reboiler heat to the low-pressure still. All three sections of the plant, extraction, dehydration, and desulfurization, are served by these heaters. Hot lean oil is used for all other reboilers.

Water for engine cooling is purified by distillation since the limited amount of water available in the area is unsatisfactory for such service even when conditioned by usual methods. The cooling water for the engine jackets flows in a closed circuit. Heat is removed by radiator-type cooling units. Distilled makeup water is produced at the plant. Heat for generating steam in the water-distillation operation is obtained from the oil-purifying unit waste-heat steam generator.

A flow-controlled slipstream on bypass is taken off of the reboiler heating-oil circuit for processing in an oil-purifying unit. The oil processed in this unit is returned to storage. The same material, 42-44 absorption oil, is employed for heating and for absorption. The two systems are tied together and equipped with automatic controls for maintaining the proper oil volume in each circuit. Makeup oil is supplied automatically.

Oil vapor instead of steam is employed in all stripping operations. This method of stripping is shown by plant operation records to give excellent results. The particular advantage in using oil vapor instead of steam for this operation at this plant lies in the elimination of steam-generating equipment and in the reduction of condensing equipment in stripper overhead streams. Because of the nature of the water available for plant operations the elimination of steam and condensing-cooling water

XUM

in this operation alone is important economically.

Since no steam is generated other than for supplying distilled water for engine cooling, all reciprocating pumps are powered with gas. Takeoff point for power gas is made in the absorber overhead line after the stream enters the third-stage inlet scrubbers. Pressure on this line is approximately 195 psi. The pumps exhaust to the plant fuel system via an accumulator tank. Variation in pressure differential in the power and exhaust gas lines does not affect operation of any of the reciprocating pumps since they are instrument controlled. All other pumps are electric-motor-powered centrifugal units.

The major processing procedure in the natural-gasoline and L.P.G. extraction section of the plant is accomplished in seven steps. In the absorption step, is one 7 by 74-ft. absorber with 24 plates. A 6 by 42-ft. 16-plate stripper is connected into the system ahead of a 3 by 70-ft. absorber. Normal operating pressure in the stripper is 70 psi. This is 125 psi. less than the pressure in the absorbers and 25 psi. greater than that in the 31-plate reabsorber. The high-pressure still, a 4 by 40-ft. vessel with 14 plates, is maintained at 105 psi. The low-pressure still, 6 by 64 ft. is operated at 65 psi. and has 26 plates. A 4 by 80-ft. column is employed for stabilizing overhead material from both high and low-pressure stills. This vessel is equipped with 36 plates and operates at 235 psi. Overhead make from the stabilizer is processed in a 2.5 by 80-ft. fractionator. This vessel, the last step in the extraction operation, is provided with 36 plates and operates at 485 psi.

The greater part, approximately 80 per cent, of the cooling-condensing load for the entire plant is accomplished with air coolers. Air cooling is carried out on all three stages of compression which is made up of a total of 12 compressor units. The same type of cooling is used on the overhead from both stills and from the stabilizer. All air coolers are equipped with electric-motor-driven fans. In each of the different services the air coolers are augmented with tubular-type final water coolers most of which are not operated in cool weather. Water for the tubular units is treated.

Control of the extraction section is centralized in one building located adjacent to both high and low-pressure operations. Control instruments for the operation of the dehydration and desulfurization units are in locations separate from that of the extraction section. With exception of the fired heaters all equipment is located conveniently in the processing area.

Instrumentation of the plant provides complete control of all processing operations from one point, the control house. In addition to recording controlling instruments and panelboard-mounted controllers the control-room instrument panel is equipped with a multipoint electronic potentiometer which provides instant information on temperature conditions at important points in the process. A battery of indicating pressure gages is also located on the central panel board.

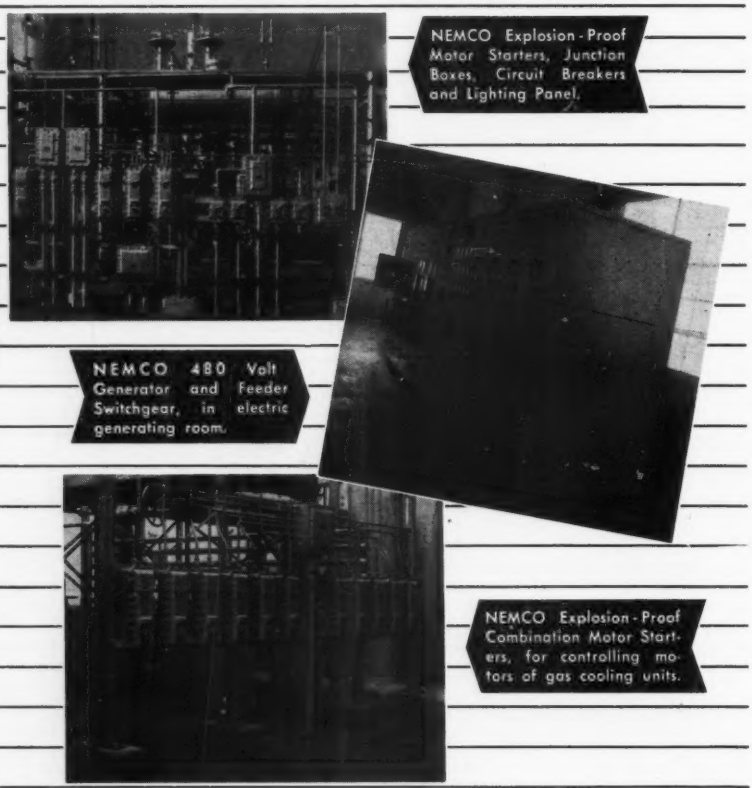
Electrical power requirements for plant operation in normal cool weather is approximately 800 kw. This load is handled with four gas-engine-driven units. Each of these units supplies 440-volt, 3-phase a.c. and are rated at 250 kw. Maximum electrical power requirements for warm-weather operation will run to approximately 925 kw. This increase is due to more than doubling of the cooling-water circulation over that required in cool weather.

Over-all flexibility of the plant permits a wide variation in product specifications. As now equipped the plant may be operated automatically to produce 12 to 26-R.v.p. natural gasoline and L.P.G. The entire layout is self-contained and may be operated with a minimum of skilled operators.

Design and construction of this latest Skelly plant was performed by Born Engineering Co., Tulsa, in collaboration with J. W. Vaiden, vice president; G. E. Canaday, manager gasoline department; E. J. Sour, purchasing department; J. Y. Haslam, chief engineer, and other members of the Skelly organization.

NELSON control equipment....

is "part of the picture" at Skelly Oil Company's New Gasoline Plant at Velma, Oklahoma



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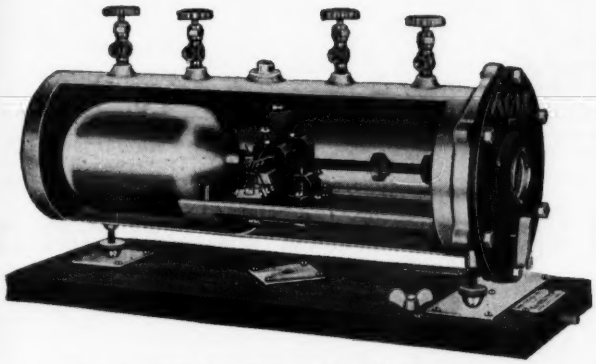

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Each unit is completely equipped with needle valves and carrying case.

Designed for laboratory, plant and field

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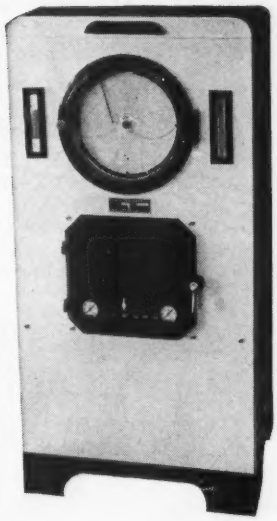

This instrument accurately records the changing gravity of gas and automatically corrects for variation in barometric pressure and temperature.

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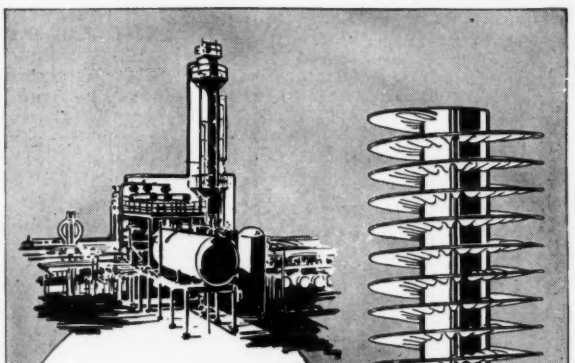

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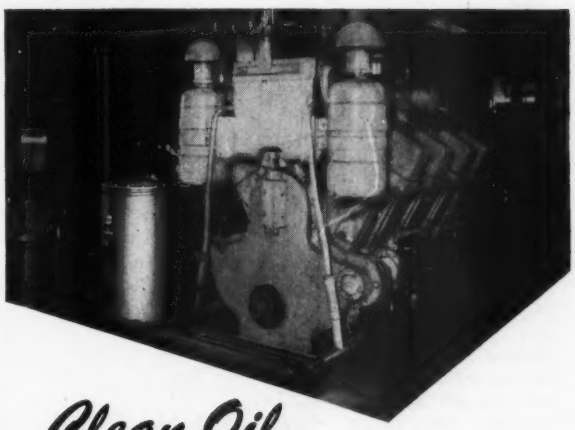

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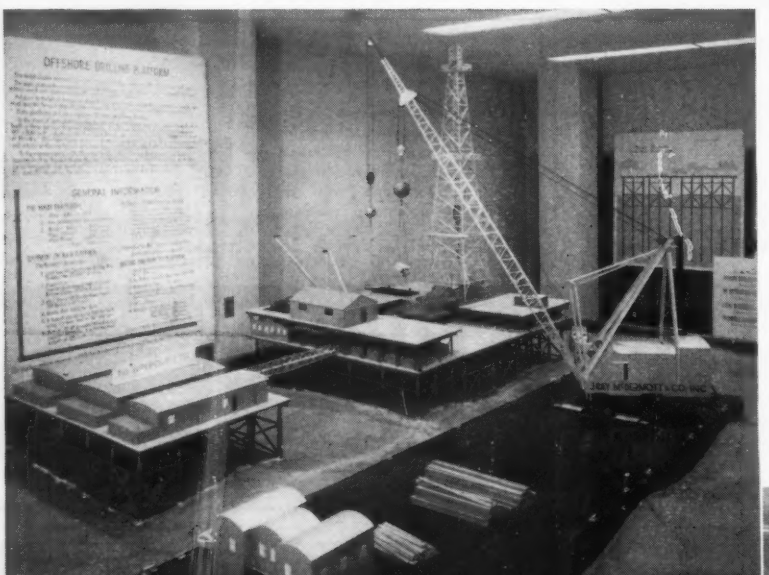
LARGEST Offshore Drilling Structures Yet Built Will Operate in Gulf Coastal Waters

by Leigh S. McCaslin, Jr.



This model shows design and construction features for the largest offshore drilling structure (will be 100 per cent salvable). Two structures based on this model are now being fabricated for Superior Oil Co. of California. The crane barge will not be a permanent part of the setup, but will merely be used for erecting the drilling structure. The model was built by Avondale Marine Ways, Inc., builders of many of the structures now being used in the Gulf. Photos courtesy The Times Picayune, New Orleans

TWO offshore drilling structures—the largest yet built and 100 per cent salvable—are now being fabricated for use in the Gulf of Mexico by Superior Oil Co. of California.

An indication of the immensity of the structures can be gained from these facts:

The deck area of each approximates 1 acre.

Each installation will involve approximately 600 tons of structural steel, 1,650 tons of tubular products, and over 200,000 board feet of lumber.

The main platform (each structure consists of two platforms) will be 126 by 172 ft. with space for the drilling of one vertical and four deflected wells.

The drilling rig will be capable of

going to 20,000 ft. with 4½-in. drill pipe.

A 189-ft. derrick designed to withstand 125-m.p.h. winds and with a 32-ft. 10-in. base, and load capacity of 1,100,000 lb., will be erected on the platform.

The largest sea-going barge and Whirley-type crane in Gulf Coast waters will be used to erect the drilling structures.

The striking feature of the design of these structures is the fact that the various components of the drilling rig are unitized with the deck sections of the drilling platform. It is contemplated to rig up, entirely on land, various parts of the rig and auxiliary units together with sections of the deck superstructure. Thirteen large packages or lifts (some weighing over 200 tons) are being built. These will be picked up, placed, and secured to piling foundations which will have previously been put in place.

The piling foundations forming the substructure will be of the jacket type which is patented by J. Ray McDermott & Co., Inc., Harvey, La. Piling will be 16-in. o.d., jacket columns 18-in. o.d. and jacket bracing of various sizes from 4½ to 12¾ in. o.d. This type of prefabricated, all-steel structure was first erected in the Gulf of Mexico in 1947 on Superior's Block 71 drilling site off Vermilion Parish, Louisiana. At that time it represented a radical change in platform design. In contrast with previous methods which required the driving of many individual piles, this structure consisted of six large templates. The six templates were simply small, individual platforms which as a group comprised the large drilling platform. To erect the platform, piles were driven down through the hollow-steel members comprising the templates.

It is estimated that the platform can be erected and ready for operation in 2 to 3 days after the substructure has been erected. (It took 9 days to erect the substructure for Superior's Block 71 platform. However, the time would have been less than a week but for high winds on three of the working days.) If no oil is found, the erection procedure can be reversed and all the equipment moved to another location. The platform and templates are 100 per per cent salvable. If oil is found, sufficient of the substructure to support producing operations can be left in place, and the remainder moved to another drilling location.

To Be Erected This Spring

Superior is planning to erect the platforms in the gulf this spring and summer. Location will probably be on the company's 61,000 acres of state leases in the West Cameron area of Louisiana.

The designers believe that these large platforms will eliminate many of the difficulties formerly encountered in offshore drilling. It is felt that the hazards of the sea can be largely eliminated and that continuous operation will be guaranteed. An installation of this type is expected by the designers to do the job more efficiently, provide better working and living conditions for crew members, and to reduce the cost of the operation in the long run. The prefabricated units which form the platform are expected to approach the portability of an L.S.T. or Y.F. barge without the high initial cost, maintenance, and operating cost that they incur.

Superior's new drilling structure will consist of two platforms—a drilling platform and a quarters' platform—connected by an 80-ft. clear-span foot bridge. The main platform will be 126 ft. in width and 172 ft. in length with space for the drilling of one straight well and four deflected ones. It will weigh 1,660 tons which is broken down as follows: deck, 510 tons; pipe jackets, 700 tons; and pipe piling, 450 tons. The rig which Superior contemplates using consists of the following units: National Type 160 consolidated drilling rig powered by four Superior supercharged PTDS-8 diesel drilling engines, 650 hp. each; two Type E-700 duplex power pumps, 700 hydraulic horsepower each; standby unit and sand reel; Ideal crown and traveling blocks for 540-ton load using 1½-in. wire line on 60-in. sheaves; 32-ft. 10-in. base derrick with 189 ft. of working space, capacity 1,100,000 lb. to withstand 125-m.p.h. wind.

In addition there will be a Halliburton dual-type skid unit for offshore cementing with three pumps, two of which can be compounded. Pumps are powered by General Motors 471 diesels and the unit is equipped with torque converters. It is capable of mixing 42 sacks of concrete per minute with a maximum working pressure of 8,000 to 10,000 psi. A Schlumberger electric logging unit will also be installed on the main platform.

Miscellaneous equipment consists of three auxiliary mud tanks, six fresh water tanks, a 30 by 40-ft. house with rooms for generators, tools, office, showers, etc., and two stiff-leg derricks. A section of the upper deck 90 ft. long is allotted for 1,000,000 lb. of pipe and drill stem if required.

Large Quarters' Platform

The quarters' platform is 74 ft. wide and 108 ft. long and three houses will be located on it. The weight of the platform is 540 tons including: steel houses, 60 tons; pipe jackets, 300 tons; and pipe pilings, 180 tons. One of these houses (30 by 54 ft.) will provide sleeping quarters for 24 men. A second house (30 by 54 ft.) will have sleeping quarters for 18 men in addition to a large lounge and radio room. The third house (20 by 54 ft.) consists of dining hall, store rooms, galley, and sleeping quarters for the cooks and helpers. Each building has its own air-conditioning and heating unit, showers, toilets, and other conveniences. All the buildings are completely prefabricated and fitted out on land so as to be ready for occupancy as soon as they are placed on the foundations. Considerable space is left on the platform around the houses for relaxation, fishing, etc.

The 13 large packages or lifts which are prefabricated for the structure are as follows:

1. Double-decked unit and six 250-lb. rectangular water tanks on the lower deck with pipe-rack platform above.
2. Double-decked series of trussed substructures for the dual draw works in the various positions required to drill five wells.
3. Lower sections (to the top of the V) of the derrick, pad, and dual draw-works unit and rotary.
4. Three main engines, substructure, and pad.
5. Two main circulating mud pumps with auxiliary engine and pad.
6. Circulating mud tanks and pad.
7. Double-decked pipe rack extension having two 250-bbl. fuel tanks on the lower deck and stiff-leg derrick and hoist on the upper deck.
8. Double-decked portion of the mud-house platform having generator, office, and tool house on the lower deck and Halliburton unit above.
9. Double-decked section of mud house platform having mud-mixing pump and tank on lower deck with mud house above.
10. Double-decked section of mud house platform having four 250-bbl. reserve mud tanks on the lower deck. Storage space and stiff-leg derrick on the upper deck.
11, 12, 13. The three houses for the quarters' platform.

In addition to the above there are several small pads which will be placed on the main platform. These pads are used to facilitate skidding the rig for drilling additional wells. They are 8 ft. in width and for every move one pad is lifted out, the rig skidded, and the pad reinserted on the opposite side. Thus complete deck coverage for all positions of the drilling rig is given.

195-Ft. Boom on Crane

In order to erect this structure, some of the lifts of which will weigh 200 tons or over, J. Ray McDermott & Co., Inc., is building a sea-going barge and Whirley-type crane, which when completed in the spring of 1949 will be the largest one in Gulf Coast waters. It will be owned and operated by McDermott, and used for jobs other than the erection of the Superior platforms.

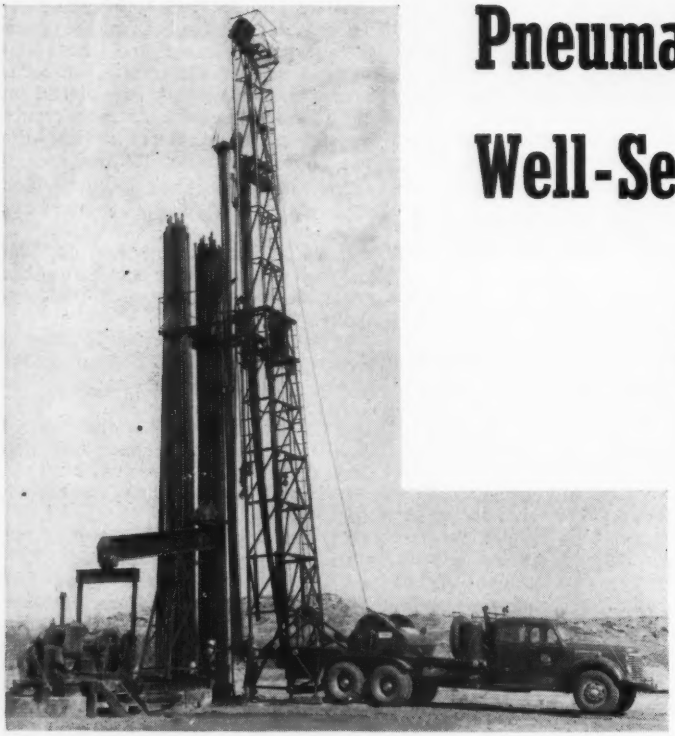
The barge will be 90 ft. wide and 300 ft. long having 14-ft. draft. It is being built in three sections so that two sides can be removed for dry docking or movement through inland waterways. The crane has a boom having a total length to the auxiliary

(Continued on page 89)

Pneumatic Controls Speed Well-Servicing Operations

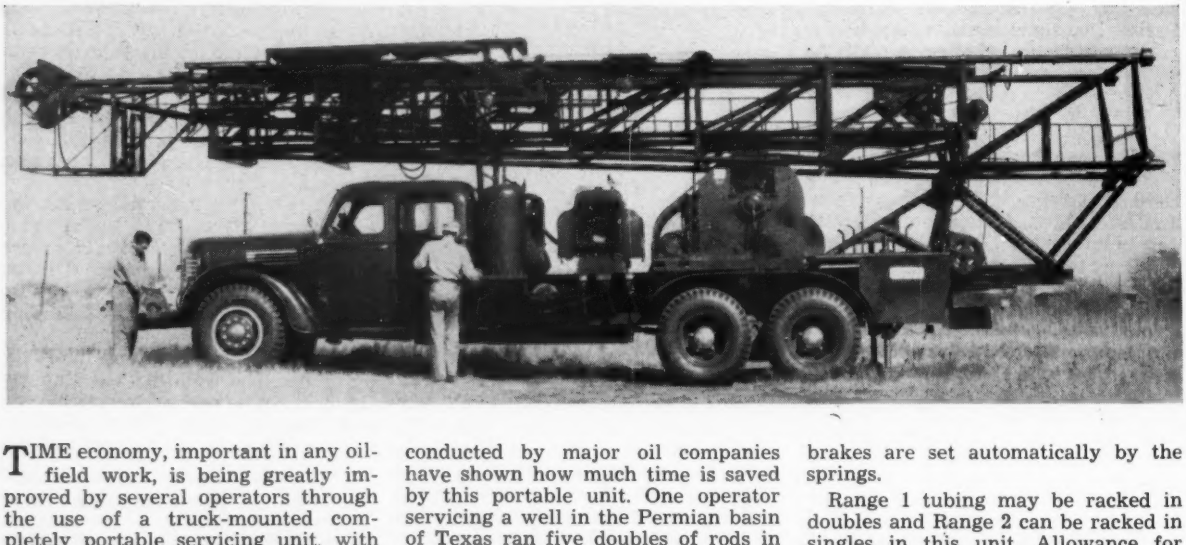
A 35 Per Cent Time Gain Is Effected by New Unit

by Roy F. Carlson



Left: The adjustable tubing board may be raised or lowered to accommodate either range 2 tubing in singles, or range 1 tubing in doubles. Rods are hung in two hangers, one on either side of the mast

Below: Collapsed for over-the-road movement, the new portable unit measures 43 ft. 8 in. long, 8 ft. 4 in. wide, and 12 ft. high. A separately powered air compressor for use with tubing and rod tongs is installed on this unit



TIME economy, important in any oilfield work, is being greatly improved by several operators through the use of a truck-mounted completely portable servicing unit, with remote air-operated controls. Savings in time of as much as 35 per cent have resulted when this equipment has been used in place of the conventional pole-type unit, largely because both rods and tubing are hung or racked in the derrick rather than laid down. Improved leveling devices and an easily raised telescoping derrick accelerate rigging up and tearing down at locations. Air-operated power tongs used in conjunction with this equipment have also helped to speed servicing operations.

Several of these units are now in operation, in West Texas, southern Oklahoma, North Texas, and Kansas. Time studies of these field operations conducted by major oil companies have shown how much time is saved by this portable unit. One operator servicing a well in the Permian basin of Texas ran five doubles of rods in 1 minute, an average of 12 seconds per stand. Time was checked during an ordinary servicing operation. At that rate under optimum conditions, a 5,000-ft. string of rods could be run in 20 minutes.

Maximum safety and smoothness of operation is provided by a revised brake system. Powerful springs are built into the brakes to provide for engagement at all times. The brakes are released by application of air pressure to pistons connected to the brake shoes. Control for the brakes, as for most of the unit's equipment, is remote, through utilization of air pressure. In the event of an air-line break or loss of air pressure the brakes are set automatically by the springs.

Range 1 tubing may be racked in doubles and Range 2 can be racked in singles in this unit. Allowance for the variations in length is provided by a tubing board that may be raised and lowered at will and has 16 ft. of adjustment. Ample provision is made by this adjustment for servicing wells with high christmas trees from a builtup substructure. The tubing board may be raised and lowered by a manually operated valve on the ground, and the board is also folded and unfolded from the derrick by a ground-level air control. Space is provided in the tubing racks for 5,000 ft. of 2⅞-in. tubing in singles. The racking fingers open toward the front and locking latch is provided for each row. A hand rail is built around the tubing board, and a safety walk for

The "Telemech" remote pneumatic controls (foreground) permit the operator to select the best possible point from which to watch floor work. Rods are held out of the way of the roustabouts after being hung in the derrick

the derrick man is furnished for safe descent from the board. The tubing board is always in place, even while rods are being removed from the well.

Rods are hung in the mast in doubles, balance for the unit being insured by the use of two rod hangers, one on either side. The rod board or monkey basket is integral with the derrick. Once the rods are hung in the derrick, there is no further need for moving the rods if pulling the tubing becomes necessary, since the rods are pulled through the tubing board.

Racking of the rods in the rod hanger is accomplished by means of an air-operated transfer elevator. The elevator fits over the wrench square on the rod, and is held securely in position by a sliding ring. The double of rods is lifted by an air cylinder attached to the rod elevator by a 20-ft. length of cable which runs over a hay pulley fixed in the derrick just below the water table. Wrenching is made easy by regulation of the air supply to the cylinder so that the weight of the rods is lifted from the joint. With the weight of the rods taken by the elevator and the long line above the elevator, rods are placed in the hanger with little effort on the part of the derrick man. Air pressure is controlled by a foot-operated valve on the mankey board, leaving both the derrick man's hands free for transferring and racking the rods.

The derrick is raised by a screw and pitman mechanism, which provides positive control of the derrick at all stages of elevation. The mast can be tilted to as much as 8° past vertical, and is even then under absolute control. Ratchet screws on all of the derrick legs contact with the ground, and provide rapid adjustment of the derrick at the well. The adjusting screws are installed about chest high for accessibility. A spirit-level vernier on the derrick provides a means of adjusting it to exact position over the well head.

Maximum Portability

The derrick is packaged for moving by telescoping, the 66-ft. tower collapsing into a package small enough for highway travel. The top section of the derrick is raised or lowered by a small winch mounted beneath the truck bed. A device which will extend the derrick while it is being raised is available with the unit; however, in normal operation it is first raised, then extended. The derrick is guyed by two cables to the front of the truck, which are tightened by air winches or hand cranks—only these two guys are necessary.

Drum clutches, air brakes, accelerator, starter button, and ignition lock are operated from a remote master control box. All operations are controlled pneumatically from this box which may be placed anywhere within a 25-ft. radius of the rear of the truck, giving the operator the best possible position from which to view the work in the derrick and at the well head.

Standard crew on this unit consists of the unit operator, a derrick man, and two floor men. Air-driven tubing tongs can be used with the unit and provide for more efficient utilization of the available manpower. Power air for the tongs can be furnished by the control-air system or by a separately powered compressor. All equipment, including the derrick, hoist, control-air compressor, and rod and tubing tools, are placed on a large tandem-drive truck for maximum portability.

The master control box is housed in a weatherproof compartment on the truck, the air lines leading to the box remaining connected at all times. Both the hoisting drum and control-air compressor are powered by the truck engine. The disposition of tools and equipment is skilfully engineered so as to provide the best load distribution. All tires are well within rated capacity.

57° Directional Well

(Continued from page 61)

cessfully projected beyond the edge of the salt, the angle was purposely dropped, reaching 42½° at 3,280 ft., where the bit again went into salt. Bottom of No. 1 stretched in a northeasterly direction and was located almost 1,700 ft. from the center of the derrick, at a true depth of 2,577.66 ft. Decision was made to plug No. 1, skid, and commence drilling on Well No. 2.

With the derrick moved 5 ft. farther to the east, work began on Well No. 2, Block 62, with the object being to deflect again toward the edge of the dome but in a direction more toward the east, less to the north, than Well No. 1, and with greater total deflection. Again the spud bit was the tool selected for the deviation, and the angle was developed at a rapid but safe rate, reaching 26° at 1,100 ft., 40° at 1,400 ft., and 49½° at 1,950 ft. (all the above depths being measured, not actual depths). Once again lost circulation delayed operations, resulting in sticking the drill pipe, finally requiring setting a plug at about 1,580 ft., where the hole showed an angle of 45½° from vertical.

Having had success in sidetracking Well No. 1 on the high side, the spud bit was oriented toward the high side of the hole, and after spudding and drilling a few feet, the sidetracking was accomplished, with the angle iincreasing to 49½°. The angle was developed further, reaching a maximum of 57½° at a measured depth of 2,126 ft., or 1,781 ft. true depth, from which point, as in Well No. 1, the angle was allowed to drop toward the vertical as the outward deflection was believed sufficient. Seven-inch casing was run to 2,800 ft. In drilling deeper, hard salt was cored at 2,829 ft., at which depth the well was subsequently abandoned. Bottom of Well No. 2 at the casing depth was located 1,452.66 ft. from the center of the derrick, the true depth being only 2,199.76 ft., for an average drift/depth ratio of 0.660 to 1.

Casing program employed by Magnolia during the high-angle drilling

included setting several strings of pipe as a safety precaution. For the two directional wells, 20-in. conductor pipe was driven 160 ft., followed by about 500 ft. of 13⅜-in pipe. At around 1,400 ft. 9⅝-in. casing was set, with 7-in. pipe run to about 2,800 ft. Below the 7-in. a 6-in. hole was drilled.

Despite the high angle maintained, little difficulty was encountered while running the casing. The 7-in., having collars 7⅝-in. o.d., was run into the 8½-in. hole without trouble, although the hole curved from vertical up to a 57½° angle, then returned toward the vertical again.

It is interesting to note that while drilling at the highest angle attained in Well No. 2, that is, 57½°, considerably greater footage was drilled laterally than vertically. Specifically, for each 100 ft. of hole drilled by actual measurement, the depth was increased by only 53.73 ft., whereas the lateral distance traveled was almost 85 ft., for a drift/depth ratio of 1.58 to 1.

At high angles, there is a wide variation between the measured and the true depths, in contrast to low-angle drilling where the difference in measured and true depths is relatively small and often of no consequence. Well No. 1, for example, measured 3,280 ft. deep before being plugged; however, its true depth was only 2,579.76 ft., a difference slightly greater than 700 ft. Well No. 2 showed a large discrepancy for a shallow hole, with a difference of over 628 ft. between its true and measured depths.

Practical evidence of the feasibility of drilling with extremely high angles even in the soft formations under the Gulf of Mexico, as accomplished by Magnolia in Block 62, opens new possibilities for offshore prospecting and development. In consideration of Magnolia's Well No. 2, for instance, at the depth where the maximum angle of 57½° was reached. Bottom of the hole was deflected outward nearly 900 ft. from the derrick, at a true depth of only 1,781 ft. Although this hole extended in only a single direction, the deflection represents the radius of a circular plane located at that depth, with the rig located directly above its center. (See Fig. 2). Any portion of the subsurface formation at a corresponding depth and situated within the confines of that circle, can be reached with the directionally controlled bit. The area of this explorable section 1,781 ft. beneath the gulf encompasses over 2½ million square feet—all accessible from a single surface location!

Area Expands Rapidly

At greater depths, if drilling continued with the same maximum angle, this area expands in astounding proportions. For instance, in deepening the above directional hole to 2,500 ft. with 57½° angle, the lateral deflection then amounts to 2,000 ft., to permit drilling to any rim of a circle 4,000 ft. across, with a drift/depth ratio of 0.8 to 1. In projecting the Magnolia hole to 3,300 ft., the deflection equals the depth, the drift/depth ratio becomes 1 to 1, and the operating radius reaches 3,300 ft. Drilled under these conditions the explorable area of a circular plane at 3,300 ft. with a 6,600-ft. diameter is 34 million square feet, any point capable of penetration by a directional hole. Expressed in more comprehensive terms, this area encompasses over 780 acres located 3,300 ft. below the gulf, which, in case of 40-acre spacing, permits completing 19 properly spaced wells from a single platform. Staggering possibilities are visualized by contemplating high-angle drilling to even greater depths.

A vertical section showing the explorable subsurface area places the drilling platform over the center of an inverted and rapidly diverging "cone of penetration." (See Fig. 3). Any point within the confines of the cone lies within reach of a directional hole. The vertical section shows graphically the extent of increase of the explorable area with greater depths, the drift/depth ratio quickly reaching a large figure after development of the maximum drift angle.

The figures cited are based on experience on Block 62 only down to 1,781 ft.; below that depth the figures merely speculate on the possibilities presented by continuing to drill with the angle already established.

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CORROSION INHIBITION with Chromate

A SERIES — By MARC DARRIN

3. Gas-Processing Plants and Refineries

PROBABLY the most costly parts of a gas-processing plant are the compressors and engines. These are cooled by water which circulates through their jackets. Unless the water is properly treated, severe corrosion and damage to engine parts may result. The several types of cooling systems require minor differences in chromate treatment to give maximum protection, but, in general, the method is simple and highly effective. The following directions apply not only to cycling-plant compressors but to almost all stationary internal-combustion engines, either of the diesel or spark-ignited type.[1]

Closed Engine-Jacket Systems

When the primary system is closed, the recirculated jacket water is cooled by passing through a water-to-water heat exchanger, although some small installations may employ air-cooled radiators. In small installations the method of using chromate in the closed primary system is about the same as for an automobile. In larger installations it is customary to employ concentrations of 400 to 1,000 p.p.m. of chromate, with alkalinity adjusted to pH 7.5 to 9.5, by means of small additions of caustic soda. Although less chromate can be used in these systems, there is no economy in doing so, since little loss occurs, and the use of lower concentrations entails more frequent testing.

Open Engine-Jacket Systems

Direct cooling of the water from the engine jacket by circulation through an open cooler may be employed for medium or large stationary installations, especially where the quality of the raw water is good but the supply limited. According to this method the water is pumped from a storage tank or pond directly through the engine jacket whence it flows through an open cooler, such as a tower, and back to storage. These open systems have an evaporative loss of about 4 to 6 lb. of water per brake horsepower per hour. This means that there is an evaporative concentration of dissolved salts which may cause severe corrosion unless the water is properly treated. For large installations the method of using chromate is essentially the same as will be described presently for cooling towers. For small equipment the proportions are similar to those used in closed systems, with sufficient water purge to limit soluble salt concentration.

Piston Cooling

In large high-duty diesels, pistons as well as cylinder jackets may be water cooled. Corrosion prevention in the piston-water system is doubly important, since accumulated corrosion products may choke already small and inaccessible passages. Also, if a high-pressure pump is employed to circulate this water, corrosion inhibition may significantly prolong its useful life. Frequently chromated water for piston cooling is drawn from the engine-jacket system. On occasion preference may exist for a separate piston-cooling system, in which case the concentration of chromate depends on whether the system is open or closed, and should be selected on the same basis as for engine-jacket water, as discussed in the two preceding paragraphs.

Air Compressors

Diesels requiring high-pressure injection air usually are supplied from multistage water-cooled compressors which use 8 to 11 per cent of the generated power. Most of this power reappears in the output of the diesel, being, in effect, a recirculating power load. Corrosion inhibition with chromate in a compressor jacket is essentially the same as in a diesel jacket.

Oil Coolers

Automobile engines dissipate sufficient heat from the crankcase so that the lubricating oil seldom exceeds a safe temperature of about 250° F.; but, for high-duty stationary diesels, it is best to maintain the lubricating oil under 200° F. by recirculation through an oil-to-air radiator or an oil-to-water heat exchanger. In the latter case, corrosion on the water side can be prevented by tapping one of the chromate-treated water systems, or by placing the oil cooler in series with the entering jacket water.

Illustration of Large Compressor Unit

This following example describes the treatment of cooling water in a plant having sixteen 800-hp. and four 400-hp. gas engines operating close to capacity 24 hours a day. Condensed process steam is used for the makeup water in the closed jacket-water systems for the engines and compressors. Sufficient sodium chromate is added once a week to maintain a concentration of not less than 400 p.p.m. The pH is adjusted to about 8.5 with soda ash. No other chemical is added. The jacket water is recirculated through seven tubular heat exchangers located in the base of a large atmospheric tower. In this installation no treatment is given to the secondary water which courses downward through the tower. This is because of an abundance of water which is largely run to waste, making its treatment uneconomical.

From the heat exchangers the jacket water is pumped into a large surge tank whence it flows back through the jackets of the engines and compressors. Chromate is introduced into the top of the surge tank about once a week. Although this is one of the largest plants of its kind, the amount of chromate consumed in the jacket system is surprisingly small, less than 50 lb. a week. This treatment keeps the heat transfer surfaces clean, and the water free from rust at all times.

Cooling Towers

The consumption of chromate in closed cooling systems is so small that it is unimportant to employ the minimum dosage; but, as will be seen, the correct control of concentration in cooling towers is important, especially when the volume of water is large or its chloride content high. The optimum concentration depends largely on the chloride content of the raw water and its evaporative concentration during recirculation. For many large plants, it is advantageous to use water-to-water heat exchangers for the primary cooling, with the secondary water recirculated through a tower. This provides flexibility since the same cooling water may be used for other purposes such as air conditioning, refrigeration, cycling units, pumping stations, and power plants.

In addition to protection against corrosion, treatment with chromate or bichromate has a sterilizing action which keeps tank and basins free from organic slimes and deposits. This fungicidal and algaecidal property is

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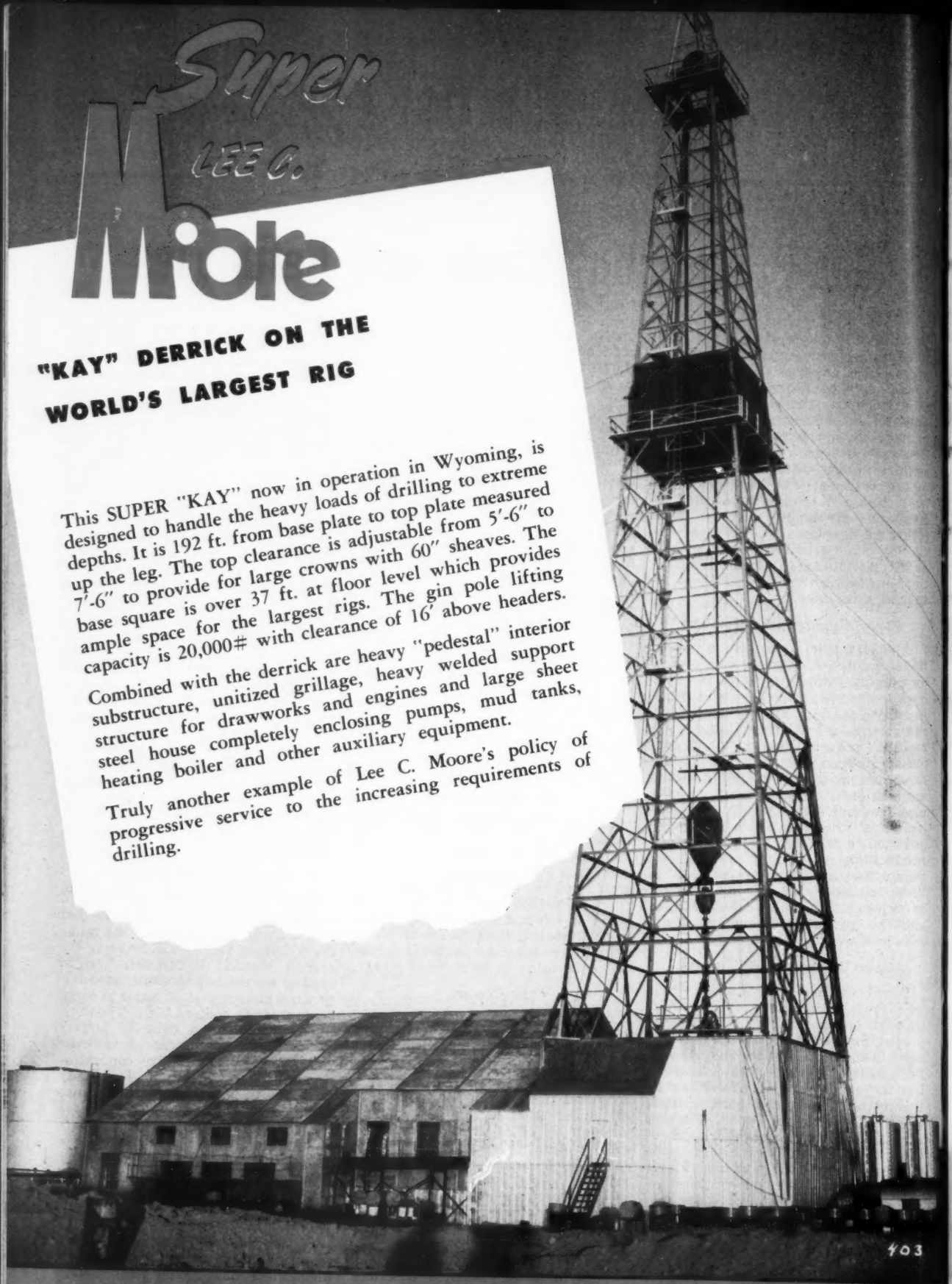

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particularly important when the water is recirculated through towers or air washers which remove large amounts of air-borne organic contaminants. In time, some organisms may become acclimated to chromate, in which event it is customary to supplement the treatment with a small dosage of a chlorophenolic compound, usually less than 1 p.p.m., or chlorination may be employed. Copper sulfate is not recommended because copper may plate out causing serious galvanic attack.

Types of Towers

The essential element of all open cooling systems is an evaporative device, such as a tower where the entering hot water courses downward through an ascending stream of air. The temperature of the water is reduced, chiefly by atmospheric evaporation, and it is commonly possible to cool the water below the temperature of the incoming air, often about halfway between the dry-bulb and wet-bulb temperatures. Cooling towers are of three general types: (1) induced draft, (2) forced draft, and (3) atmospheric or natural draft. Where ample space is available, spray ponds may be used instead of towers. If space is at a premium, towers may be located on the roof of a building, in which event they are sometimes constructed of aluminum. In this case it is particularly important to avoid bimetallic contacts.

All of the above coolers are similar in principle, differing only in mechanical detail. The evaporative loss of water, and the resulting concentrating effect on the salt content, may be calculated from the heat to be dissipated. Sometimes it is necessary to soften the entering raw water in order to remove lime or other impurities which cause scale. These pretreatments, which employ soda ash, phosphates, ion-exchange media, etc., vary greatly with individual conditions and are beyond the scope of this discussion.

Drawoff

When the make-up water contains very much dissolved salts, and there is little mechanical loss by windage or leakage, it is necessary to make periodic drawoffs to waste. By way of illustration, assume that a water contains 100 p.p.m. of sodium chloride, and loses 10 per cent by evaporation on each circulation. It would be necessary to replace this evaporation and, at the end of 90 recirculations, the water in the system would contain 1,000 p.p.m. of sodium chloride which is often a harmful concentration. Obviously some water has to be run to waste to keep down the chloride content and, since this runoff necessitates the simultaneous loss of chromate, it is important from the viewpoint of cost to employ the lowest concentration which effectively inhibits corrosion.

It is less costly to employ too much than not enough, since excess chromate not only increases the safe limit of salt concentration but reduces the amount of chromate consumed in the protection of metal surfaces.[2] For this reason it is best to start with a comparatively high concentration, 500 to 1,000 p.p.m., and gradually reduce the amount of chromate over a period of months to the lowest concentration at which the particular installation is protected against corrosion, which is usually 200 to 250 p.p.m. Some refineries have found it possible to employ concentrations as low as 60 to 100 p.p.m., but this requires daily control tests and frequent servicing, sometimes several times a day.

If, in the above example, the evaporative loss is 1,000 gal. per hour, it would be necessary to run to waste about 100 gal. in order not to exceed a concentration of 1,000 p.p.m. of chloride. Since this 100-gal. drawoff contains the maintained concentration of chromate, for example 250 p.p.m., it would be necessary to add an equivalent amount of chromate to the make-up water, in this case: $0.025 \times 8.33 = 0.19$ lb. of chromate per hour. Since the volume of the makeup is about 10 times that of the drawoff, the concentration of chromate in the makeup water would be about 25 p.p.m.

Chromate Consumption

In addition to the chromate which is drawn off, some is consumed in forming a protective film. The amount of chromate consumed in this manner may be estimated from Table 1 which shows the pounds of sodium chromate consumed per thousand square feet of exposed ferrous surface for various periods of time at normal room temperature (70° F.), completely submerged and aerated, with the pH maintained at 7.5 to 9.5. At higher temperatures the rate of consumption is somewhat higher. With partial submersion, there may be accelerated corrosion at the water line. Whether the system is aerated or nonaerated makes no difference when chromate is present.

Effect of Chloride

The first division of Table 1 is for a good water containing 10 p.p.m. NaCl; the second division is for a fair to poor water containing 100 p.p.m. NaCl; the third is for a bad water containing 1,000 p.p.m. NaCl, such as might result from concentration in an evaporative cooling system; while the last division is for an extreme condition, 10,000 p.p.m. NaCl. These data show that the effect of increased concentration of chloride is to accelerate the rate of consumption of chromate, especially during the first few days, and to increase the concentration of chromate required to protect the metal surfaces. They also show that chromate is effective in high chloride water, provided a sufficient concentration is maintained.

TABLE 1—CHROMATE CONSUMED

Pounds of chromate (Na_2CrO_4) per 1,000 sq. ft. of ferrous surface, for total elapsed days indicated, in water containing different concentrations of chloride (NaCl), with various maintained concentrations of chromate. Based on measurements at 70° F. and aerated. For higher temperatures increase the safety factor. Data do not include mechanical losses or drawoffs.

Na_2CrO_4—	25 p.p.m.	50 p.p.m.	100 p.p.m.	250 p.p.m.	500 p.p.m.	1,000 p.p.m.	25 p.p.m.	50 p.p.m.	100 p.p.m.	250 p.p.m.	500 p.p.m.	1,000 p.p.m.
	Water containing 10 p.p.m. NaCl						Water containing 100 p.p.m. NaCl					
10 days	0.57	0.70	0.26	0.09	0.01	0.05	0.96	1.22	0.42	0.33	0.20	0.27
20 days	0.73	0.99	0.38	0.14	0.01	0.07	1.45	1.73	0.67	0.55	0.25	0.37
30 days	0.83	1.13	0.45	0.17	0.01	0.09	1.72	2.03	0.80	0.69	0.26	0.40
60 days	0.99	1.37	0.54	0.20	0.02	0.12	2.15	2.48	0.95	0.82	0.27	0.46
90 days	1.07	1.53	0.58	0.22	0.03	0.13	2.49	2.76	1.00	0.87	0.27	0.49
120 days	1.15	1.65	0.60	0.24	0.03	0.13	2.79	2.97	1.03	0.90	0.27	0.51
150 days	1.21	1.76	0.62	0.26	0.04	0.14	3.07	3.13	1.04	0.91	0.27	0.52
180 days	1.28	1.85	0.63	0.27	0.04	0.14	3.35	3.27	1.04	0.92	0.27	0.52
	Water containing 1,000 p.p.m. NaCl						Water containing 10,000 p.p.m. NaCl					
10 days	1.03	1.26	0.80	0.83	0.48	0.52	1.14	1.50	1.00	1.00	0.94	0.79
20 days	1.46	1.71	1.00	1.09	0.65	0.71	1.51	1.94	1.40	1.34	1.19	0.93
30 days	1.68	2.03	1.06	1.18	0.68	0.76	1.76	2.25	1.59	1.50	1.25	0.97
60 days	2.10	2.78	1.15	1.30	0.70	0.82	2.31	2.91	1.83	1.63	1.31	0.98
90 days	2.45	3.38	1.22	1.38	0.72	0.85	2.73	3.43	1.92	1.68	1.34	0.99
120 days	2.76	3.88	1.27	1.44	0.74	0.87	3.12	3.90	1.96	1.72	1.35	1.00
150 days	3.06	4.30	1.31	1.49	0.76	0.87	3.47	4.35	2.00	1.74	1.36	1.00
180 days	3.35	4.67	1.35	1.53	0.77	0.87	3.81	4.79	2.02	1.76	1.36	1.01

TABLE 2—RATE OF CONSUMPTION

Pounds of chromate (Na_2CrO_4) per day per million square feet of ferrous surface, after various elapsed periods of time, under conditions given in Table 1.

Na_2CrO_4—	25 p.p.m.	50 p.p.m.	100 p.p.m.	250 p.p.m.	500 p.p.m.	1,000 p.p.m.	25 p.p.m.	50 p.p.m.	100 p.p.m.	250 p.p.m.	500 p.p.m.	1,000 p.p.m.
During—	Water containing 10 p.p.m. NaCl						Water containing 100 p.p.m. NaCl					
1st 10 days	57	70	26	9	<1	5	96	122	42	33	20	27
2nd 10 days	16	29	12	5	<1	2	49	51	25	22	5	10
3rd 10 days	10	14	7	3	<1	2	27	30	13	14	1	3
2nd month	5	8	3	1	<1	1	14	15	5	4	<1	2
3rd month	3	5	1	1	<1	<1	11	9	2	2	<1	1
4th month	3	4	1	1	<1	<1	10	7	1	1	<1	1
5th month	2	4	1	1	<1	<1	9	5	<1	<1	<1	<1
6th month	2	3	<1	<1	<1	<1	9	5	<1	<1	<1	<1
During—	Water containing 1,000 p.p.m. NaCl						Water containing 10,000 p.p.m. NaCl					
1st 10 days	103	126	80	83	48	52	114	150	100	100	94	79
2nd 10 days	43	45	20	26	17	19	37	44	40	34	25	14
3rd 10 days	22	32	6	9	3	5	25	31	19	16	6	4
2nd month	14	25	3	4	1	2	18	22	8	4	2	<1
3rd month	12	20	2	3	1	1	14	17	3	2	1	<1
4th month	10	17	2	2	1	1	13	16	1	1	<1	<1
5th month	10	14	1	2	1	<1	12	15	1	1	<1	<1
6th month	10	12	1	1	<1	<1	11	15	1	1	<1	<1

Stabilized Operation

Table 2 shows the rates of consumption of chromate after various elapsed periods of time. These data indicate that consumption of chromate is relatively high during the first few days, rapidly falling off during the first month, and gradually thereafter until it becomes stabilized in about 3 months. For practical purposes there is no difference in the consumption rate, within the range 250 to 1,000 p.p.m., after conditions have been maintained for 3 months, nor does any serious difficulty result after this time even if the concentration of chromate should drop as low as 100 p.p.m. With the recommended concentration of chromate, more than 99 per cent of the corrosion is inhibited even in the presence of high concentrations of chloride.[2]

Optimum Proportions

The most economical maintained concentration of chromate is that at which the sum of the chromate drawn off and that consumed has a minimum value; but it is not advisable ordinarily to aim at concentrations below 100 p.p.m. Furthermore, the minimum proportion should not be employed before operating for a sufficient time for the protective film to become stabilized. The only tests required are for the maintenance of correct pH and chromate concentration.

Testing and Servicing

Under most conditions the correct pH is from 7.5 to 9.5. Variation within these limits is unimportant as far as corrosion is concerned, but it may influence deposition of calcitic scale, in which event the pH should be adjusted to the figure found most advantageous for controlling scale formation, even if it should be lower than pH 7.5. Actually chromate is an effective inhibitor of steel at pH 5.5, provided its concentration is properly maintained. Since waters having a pH below 7.0 are corrosive, it is particularly important to add chromate or bichromate to waters which are held at a low pH to control scale deposition.

Solely from the standpoint of corrosion control, a faintly pink color with phenolphthalein indicator, which turns pink at about pH 8.5, is evidence of sufficient alkalinity. If a pink color does not develop, the pH should be raised by adding soda ash or caustic soda. Excess alkali, indicated by greater red color intensity, is usually of no importance, at least up to pH 9.5. Where desired, the chromate concentration can be estimated by visual comparison with solutions of known strength on the basis of depth of yellow color; several instrument manufacturers supply comparators designed for this purpose.

When starting to use chromate, good practice calls for daily checking of the yellow chromate color, and making additions as indicated thereby. Later, after the rate of addition has become fairly well established, less frequent testing is permissible. Excess chromate is not harmful but it increases consumption due to mechanical loss. In special instances where the concentration of chromate is below 200 p.p.m., more frequent servicing may be necessary.

In the foregoing we have referred to chromate concentrations rather than to bichromate concentrations, although bichromate is the chemical commonly added. This is because, at the pH to which the water is adjusted by alkali additions, the bichromate is converted to chromate, and it is this chemical which is present in the water. Choice between chromate and bichromate is largely one of cost versus convenience. To figure relative costs see the first of this series of reports.

Evaporative Condensers

Evaporative condensers operate on the same principle as cooling towers which they sometimes replace. An evaporative condenser is actually a small cooling tower where the liquid being cooled is passed through pipes over which water is run or sprayed. It is the evaporation of this water which produces the cooling effect. If this secondary water is recirculated, there is a concentration of dissolved salts which must be withdrawn from time to time. Treatment of this water with chromate or bichromate is the same as described for cooling towers.

Closed Coolers

The treatment of cooling water for ordinary condensers and similar equipment is essentially the same as for engine-cooling water. This water may itself be cooled by an evaporative effect and recirculated, in which case its treatment with chromate is the same as described for cooling towers. Frequently, however, it is circulated in a closed circuit through a water-to-water heat exchanger from which the secondary water is discharged to waste. In this case the water in the closed circuit is treated with chromate in the same manner as the water in a closed engine-jacket system.

Refrigeration and Brine

Some plants require refrigeration for condensing the more volatile products. Chromate can be added with benefit both to the brine and to the recycled cooling water for the compressed refrigerant. For the ammonia absorption process the addition of chromate to the aqueous absorbant also is desirable.

The proportions used in various brines correspond to those recommended by the American Society of Refrigerating Engineers, namely, 125 lb. of sodium bichromate per 1,000 cu. ft. of calcium chloride brine, or 200 lb. for sodium chloride brine. These proportions correspond to a maintained concentration of 2,000 and 3,300 p.p.m., respectively. The method of treatment of recycled cooling water for the compressed refrigerant is similar to that described for cooling towers or condensers, depending on the particular type employed. Proportions used in ammonia absorption

systems depend on individual conditions, but are commonly in the neighborhood of 2,000 to 4,000 p.p.m.

Heating Systems

When equipment is constructed entirely of iron or steel, corrosion may not be significant in a recirculating hot-water-heating system unless there is an appreciable loss of water, making it necessary to add fresh water which is saturated with atmospheric oxygen. When protection against corrosion is required, chromate is very effective and is applied in the same general manner as in other closed recirculating systems, the chief difference being that the rate of consumption of chromate increases somewhat with rise in temperature.

If there are zinc or galvanized parts, the rate of attack on the zinc will accelerate rapidly above 160° F., unless chromate is present. If there are bimetallic contacts with metals such as copper or brass, chromate will protect both surfaces under many ordinary conditions; but, if large amounts of chloride are present and the ratio of copper to ferrous area is high, no known inhibitor is capable of preventing galvanic attack of the ferrous surface at temperatures above 160° F.

Boiler Feed

The corrosion of boiler drums and tubes may be controlled in many instances by the addition of chromate to the feed water, after the customary softening treatment. The proportions depend on the nature of the water, the boiler pressure, and other individual conditions. The general method is to add sufficient sodium chromate to maintain a concentration of 300 to 400 p.p.m. of chromate in the blowdown. This may be judged in most instances with sufficient precision by the depth of yellow color.

An excess of chromate does no harm provided the correct alkalinity is maintained. Control of alkalinity is important in boilers where there may be danger of caustic embrittlement. Tests have shown that chromate retards ordinary types of corrosion under stress, of which caustic embrittlement is a special type, but as far as can be determined the presence of chromate is without effect as far as embrittlement of boilers is concerned. The sole function of chromate in boilers is to inhibit ordinary forms of metal attack such as rusting.

At Mutual's Baltimore plant excellent results have been obtained by maintaining a concentration of 300 p.p.m. of sodium chromate in the blowdown. Inspection of tubes after more than 20 years' service shows no rust or other signs of corrosion. These boilers generate steam at 100 to 150 psi. and it is believed that no complication would arise up to 250 psi., but chromate should not be employed in boilers operated above 200 psi. without consulting a competent chemist or engineer.

The chromate concentration in the blowdown of a large boiler should be checked about once a week. In small low-pressure boilers used for room heating, it is customary to add a large excess of chromate so as to make it unnecessary to check more than once a year. For this purpose it is common to add about 4 oz. of chromate per 100 sq. ft. of radiator surface, or per 15 gal. of water capacity, and maintain 1,000 to 2,000 p.p.m. Small hot-water-heating systems are inhibited in a similar manner, the proportions being about 8 oz. of chromate per 100 sq. ft. of radiator surface, or per 30 gal. of water capacity. Heating systems to which chemicals have been added may not be connected directly to a city water supply.

When an oxidizing inhibitor such as chromate is used, nothing is gained by deaeration, since this type of inhibitor, if anything, functions best in the presence of oxygen. As would be expected, oxidizing passivators are incompatible with reducing additives such as sulfites, but chromate may be employed with most other compounds which are used for boiler-water treatment.

In order to avoid any possible misconception, it should be kept in mind that chromate and most inhibitors are nonvolatile, hence incapable of protecting a metal surface above the level of the water. To prevent corrosion in steam condensate lines and return traps, volatile nitrogen bases have been suggested.

Standby Boilers

During idle periods the use of chromate is effective for preventing corrosion. The proportions are about 2 lb. per 1,000-gal. boiler capacity. Other idle equipment may be protected in a similar manner, bearing in mind that the higher the ratio of surface area to water volume the more chromate is required, meaning that small equipment and pipes require a heavy dosage particularly if there is no movement of the water. Narrow crevices and encrustations may slow down the penetration of chromate below the rate of consumption and thus cause localized attack. It is believed that the beneficial effect of small additions of wetting agents is due to increased rate of penetration.

References

1. Darrin, Marc, Corr. & Mat. Prot., 4 (3) 6-11 (1947); Corrosion, 3 (4) 28 (1947); Theatre Cat., 5th Ed., p. 382-5 (1947); Public Works, 78, 27 (1947).
2. Darrin, Marc, Ind. Eng. Chem., 38, 368-75 (1946); Diesel Power & Diesel Trans., 24, 578-82 (1946); Mutual Chemical Co. of Am., Serial No. 35 (1946); Diesel Revista (Buenos Aires), 1 (8) 38-42 (1947).

Largest Offshore Drilling Structures

(Continued from page 81)

hoist of approximately 195 ft. The length to the main hoist is 160 ft. where there will be a capacity of about 200 tons on a 65 ft. radius.

Living quarters for the personnel are located at the opposite side of barge from the Whirley, and compartments for generating equipment, fuel, and water are provided in the interior of the barge.

The structure was designed by the engineering department of McDermott, under the direction of M. B. Willey, chief engineer. Dry-land rigging up of the drilling platforms will be done at Avondale Marine Ways, Inc., Avondale, La. Alexander Shipyards, Inc., New Orleans, fabricated the quarters houses and mess room.

Superior Is Large Gulf Operator

Superior Oil Co., with 156,500 acres under lease in the Gulf of Mexico off the Louisiana and Texas coasts, is one of the major offshore operators. (65,280 of the 156,500 acres are jointly leased with Tidelands Oil Corp.) The company is also one of the pioneers in Gulf of Mexico operations. It was codiscoverer with Pure Oil Co. of Creole field, 1½ miles offshore from Cameron Parish, Louisiana. This field was the only substantial production found in Gulf Coast Continental Shelf waters prior to the war. It was discovered in 1938 and consists of seven wells, all drilled from the same platform.

First exploratory well to be drilled by Superior in Continental Shelf waters since the war was spudded August 23, 1947, off Vermilion Parish, Louisiana. This test in Block 71 was abandoned in December, but 6 months later, Superior reworked the hole to make a gas-distillate producer. A second gas-distillate well has just recently been completed from the same platform. The two wells have been shut in and the equipment is being moved to a new location in Block 76, 19½ miles offshore and 9 miles west of the Block 71 tests.

Off the Texas coast, Superior recently completed a dry hole in a joint operation with Tidelands Oil Corp. Tidelands was the operator for this test which is about 3½ miles offshore and 22 miles east of Port O'Connor, Calhoun County, Texas.

To provide adequate shore facilities, Superior has acquired land for a marine operating base at Harvey, across the Mississippi River from New Orleans. Present shore facilities include a machine shop and loading point on Lake Arthur near Jennings, La., and a loading point at Intercoastal City, La.

The company's offshore operations are immediately supervised from its division office in Lafayette, La. Personnel in this office include: W. S. Law, superintendent; Jack Taylor, assistant superintendent, and H. L. Franques, engineer.

QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Amortization and Depreciation Rates

Can you please direct me to information on the average economic lives of refinery and oil-field equipment?—F. M. P.

From the standpoint of taxes, the final arbiter on depreciation rates is the Bureau of Internal Revenue of the U. S. Treasury Department. Its January 1942 (latest) decision is stated in Bulletin F, entitled, "Income Tax, Depreciation and Obsolescence, Estimated Useful Lives, and Depreciation Rates" (Superintendent of Documents, Washington 25, D. C., 25 cents). Although useful lives are stated under the heading of Oil and Gas, as follows:

Development, Marketing, Production, Refining, Transportation.

These sections do not include many of the general parts of a plant or lease such as fences, buildings, repair shops, etc. The lives of such miscellaneous equipment can be found, however, scattered throughout other groups, such as Automobile Industry (repair shops), Buildings (and Equipment), Chemicals (sulfuric acid and caustic), Construction, Ice and Refrigeration, Lumber and Wood Products (sawmill and shop machinery), Metal Products and Processes (machinery), Motor Vehicles, Office Equipment, and Public Utilities (electric, gas and motor transport).

Although depreciation rates for tax purposes must be based on the Bulletin F values, engineers and companies are more interested in the true rate of amortization. Amortization rates are established from economic studies based on expected service life and the salvage values of each item of equipment. Obsolescence may dictate an end to the life of an equipment long before the equipment is mechanically defective. Likewise the cost of maintenance, or the cost of interrupting a continuous process may greatly shorten the useful service life. Robley Winfrey illustrates this clearly in his "Depreciation Need Not Be a Mystery to Power Engineers" (Power Generation, December 1948, page 109). Finally, in petroleum refineries, the rate of corrosion is vitally dependent on the characteristics of the oils being processed. Thus, with respect to the handling of certain sour or high sulfur crude oils, the following statements appeared in the literature *(Hazards and Corrosion with Sour Crudes, The Oil and Gas Journal, December 16, 1944, page 29)* when the U. S. Government asked refiners to process corrosive West Texas oils as a part of our war effort:

"Danger arises from unexpected failures due to corrosion . . . in the surprisingly short time of 2-5 months."

"Tank corrosion is usually not serious except for crude oil (6-8 years) and naphtha-rundown tanks (4-7 years) if the naphtha is not caustic washed."

"Cracking towers and chambers are lost in 6-12 months unless lined with 12 per cent chromium . . . etc."

Note that the tanks lasted only 4-8 years whereas Bulletin F expects an average life of 33 years, and that unlined cracking towers last only a few months whereas Bulletin F expects 15 years.

The general aspects of obsolescence are discussed in the Third Edition of Chemical Engineering Economics, by Tyler (McGraw-Hill Book Co., New York, 1948).

Table 1 shows the useful lives used by one small refiner and marketer in depreciating his equipment. Tabulation of the rates of depreciation of refinery and related equipment will be published in the Cost-imating series (Nos. 19 and 21) in The Oil and Gas Journal, issues of February 24 and March 10, 1949.

TABLE 1—USEFUL LIVES FROM THREE SOURCES, YEARS

	One small refinery	Approx. by Bull. F	Pet. Ref. Engineering*
Refinery:			
Receiving house, brick	34	60	12-33
Office, frame	20	40	12-33
Pumphouse, brick	35	60	12-33
Paint-shop building, frame	10	40	12-33
Topping towers	10	20	7-12
Cracking stills	8	15	4-10
Pipe stills	10	15	7-12
Compressor, small	5	10	7-16
Office machines	10	8	....
Electrical plant	36	31	....
Trucks	3	3	3-4
Tanks	10	30	20-33
Warehouse, brick	20	60	12-33
Garage	20	50	12-33
Pipe lines (short)	10-15	25	....
Telephone lines	10	33	....
Pumping stations	20	33	12-33
Field tanks	10	30	10-20
Filling stations:			
Tanks	10	20-30	20-33
Pumps and fittings	5	10	7-16
Warehouses	10	40	12-33
Buildings, brick	20	60	12-33
Office furniture	10	20	....

*Second edition, McGraw-Hill Book Co., Inc., New York.

Fractionating Tower Costs

In your Cost-imating article of January 6, 1949, on Fractionating Towers, you show a quick method of estimating the cost of fractionators. The costs seem very high and hence we should like to see more of how the costs were computed?—A. B. N.

The costs shown in Cost-imating No. 12 may appear to be large because the towers are complete. Most refiners would think of the cost of a tower as only the shell, heads, plates, and connections or manholes. The towers of Cost-imating No. 12 also include insulation, a ladder, a platform, foundation, freight, erection, and examination by X-ray, as well as stress relieving. Finally, a manhole was used on each tray (as well as one at the bottom) and the manholes are expensive. All of the costs for Cost-imating No. 12 were taken from earlier numbers of Cost-imating.

In an effort to make the "per plate" over-all costs more useful, the costs are broken up on a percentage basis in Table 1.

TABLE 1—PERCENTAGE BREAKUP OF TOWER COST

(See costs of Cost-imating No. 12, January 6, 1949)

	Percentage*
Foundations	1.2- 4.8*
Insulation	5.2- 11.0*
Erection	1.5- 6.6*
X-ray inspection	2.4- 3.0*
Stress relieving	0.8- 1.0*
Freight	1.5- 1.0*
Shop, f.o.b.	87.4- 72.6*
Total	100.0-100.0

*The last numbers are for small towers, i.e., few plates or small diameters.

Finally, if only two manholes are supplied, the f.o.b. shop costs without X-ray inspection or stress relieving are:

	Per cent of total cost*
Shop, with manholes on each tray	87.4-72.6
Manholes	7.0-40.0†
Shop, f.o.b., but only two manholes	80.4-32.6

*Cost from Cost-imating No. 12. †Large percentage is from small towers.

The larger of the two percentages in Table 1 are for small-diameter towers (except the freight item) or for towers having only a few trays.

Cost-imating

A WEEKLY FEATURE OF THE OIL ANG GAS JOURNAL

Insulation for Cold—1

SCHEDULE OF TOPICS

No. 17—February 10, 1949—Covers for Fittings—II
No. 18—February 17, 1949—Ladders and Walkways
No. 19—February 24, 1949—Depreciation Rates-Refining
No. 20—March 3, 1949—Clay and Cement Pipe

CORK insulation is offered in several special thicknesses:

STB—Special Thick Brine, 2.63-4 in. thick.

BT—Brine Thickness, 1.7-3 in. thick.

IWT—Ice Water Thickness, 1.2-1.93 in. thick.

Recommended thicknesses are indicated in Table 1 in terms of special classifications of thickness just enumerated, and using the symbols—L, lagging; B, board; and C, sectional pipe covering.

Most of the material that is shown on this page was taken from the excellent article by F. C. Otto, Estimating Cold Insulation Costs, Chem. Eng., May 1947, page 118, and additional information on insulating for cold will appear in Cost-imating No. 17 (Covers for Fittings) of February 10, 1949. Costs were converted from 1947 to 1946 by a material index of 113 and a labor index of 116. List prices are larger by about 10 per cent, but specifically about:

Size of order—	List price is higher by
Up to $500	72-102%
$500-$7,500	78-111%
$7,500 up	102-117%

TABLE 3
Approximate Prices of Sectional Cork Pipe Covering, 1946
($ per foot)

Diam. (in.)	BT	STB	IWT
¼	0.55	0.93	0.44
⅜	0.55	0.93	0.44
½	0.55	0.93	0.44
¾	0.60	0.93	0.47
1	0.69	1.15	0.53
1½	1.00	1.28	0.62
2	1.04	1.55	0.69
3	1.46	1.75	0.82
4	1.75	2.34	1.13
6	2.34	3.45	1.86
8	3.01	5.75	2.43
10	5.07	6.57	3.82
12	5.47	7.13	3.96
14	6.20	7.92	4.00
16	6.58	8.39	4.56
18	7.06	9.43	5.00
20	7.60	10.20	5.27

TABLE 1—RECOMMENDED KIND* AND THICKNESSES OF CORK, INSULATION (IN.)

Temperature of service (°F.)	Pipe or equipment diameter (in.) Pipe, ¼-1½-in.	Pipe, 2-7-in.	Pipe, 8-20-in.	Vessels or pipe, 20-54-in.	Vessels or pipe, 54-120-in.	Vessels walls, over 20-in.
—300 to 250	6-8, C	9-11, C	12-14, C	14-16, C	16-18, B	22, B
—200 to 150	5-6, C	7- 8, C	9-11, C	11-12, C	12-15, B	15, B
—100 to 50	4, C	5- 6, C	7- 8, C	8- 9, C	8-10, B	10, B
— 50 to 20	4, C	4- 5, C	5- 6, C	6- 7, C	7- 9, B	9, B
— 20 to 0	STB, C	STB, C	5, C	5- 6, C	6- 8, B	8, B
0 to 20	BT, C	STB, C	STB, C	4, L	4- 6, B	6, B
20 to 50	BT, C	BT, C	BT, C	3, L	3- 4, B	4, B
50 to 100	IWT, C	IWT, C	IWT, C	2, L	2, B	2, B

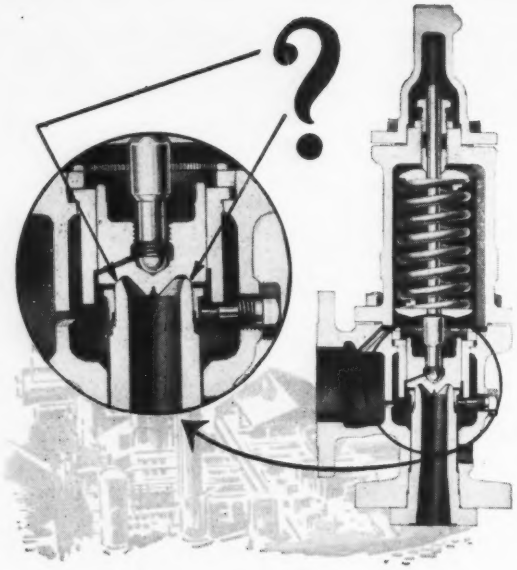
*C—sectional pipe covering; L—lagging; B—board; STB—Special Thick Brine; BT—Brine Thickness; and IWT—Ice Water Thickness.

TABLE 2—APPROXIMATE PRICES OF STANDARD CORKBOARD OR LAGGING ($ PER SQ. FT.*), 1946

Thickness (in.)	Board	Lagging	Installation of board— No. of layers	Below 15 ft.	Above 15 ft.	Installation of cork lagging— Below 15 ft.	Above 15 ft.	Below 15 ft.	Above 15 ft.
1	0.16	0.34	1	0.60	0.76	0.78	0.97	1.12	1.41
1½	0.22	0.43				0.78	0.97	1.12	1.41
2	0.30	0.50	1	0.60	0.76	0.78	0.97	1.12	1.41
3	0.46	0.66	2	0.90	1.14	0.78	0.97	1.12	1.41
4	0.60	0.86	2	0.90	1.14	0.90	1.13	1.25	1.57
5		1.02	2	0.90	1.14	0.95	1.19	1.29	1.62
6	0.90	1.19	3	1.21	1.56	1.03	1.29	1.38	1.72
7		1.38				1.08	1.35	1.42	1.78
8		1.54	3	1.21	1.56	1.12	1.41	1.46	1.83
10		1.89				1.21	1.51	1.55	1.94

*Disks about 50 per cent more.

No. 16 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa



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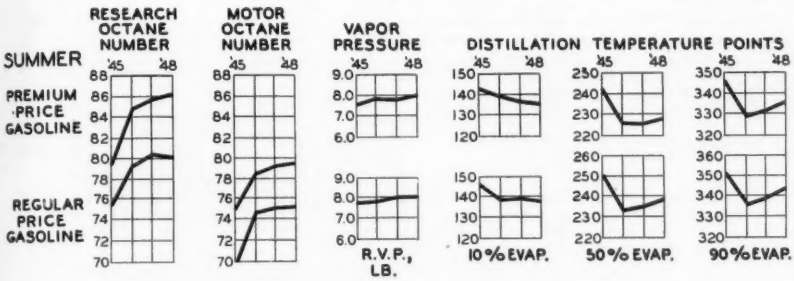
SUMMARY OF PRODUCT DATA FOR PAST FOUR YEARLY PERIODS

	Summer	Research octane No.	Motor octane No.	R.v.p. (lb.)	10% evap. (°F.)	50% evap. (°F.)	90% evap. (°F.)
Premium-price gasoline	1945	79.7	74.9	7.6	142	243	346
	1946	84.7	78.3	7.8	139	226	329
	1947	85.9	79.2	7.8	137	226	331
	1948	86.1	79.5	8.0	136	228	335
Regular-price gasoline	1945	73.3	69.7	7.7	145	251	351
	1946	79.3	74.4	7.8	139	233	336
	1947	80.2	75.1	8.0	139	235	339
	1948	80.1	75.2	8.0	138	238	343



National Motor-Gasoline Survey

by O. C. Blade*

OCTANE numbers of motor gasolines sold in the United States during the summer of 1948 were slightly higher than for those of the preceding summer and represent a less pronounced but continued trend upward from the low-octane fuels sold during the summer of 1945 when wartime restrictions were in effect.

The research method octane numbers of both premium and regular-price gasolines showed sharp upward trends during the first year following the summer of 1945 and more gradual but still pronounced rises to the next summer of 1947. The survey for summer 1948, just completed, indicates these increases are leveling off—the average research value for the premium-price fuel going from 85.9 to 86.1 and the regular-price fuel from 80.2 to 80.1 during the past two summers, respectively. The accompanying table and set of charts show the values and trends for the four summers.

Motor-method octane numbers of the same fuels also showed increases—the trends being almost parallel to those of the research method. As the chart shows, the motor octane values for the past summer are only slightly above those of the preceding summer. Premium-price gasolines for the summer of 1947 have an average octane number of 79.5—four and one-half numbers above that of 1945—and the regular-price fuels have an average octane value of 75.2—which is five and one-half numbers above the average for the summer of 1945. As the samples of gasoline for the survey of summer 1945 were collected before V-J Day, the trends discussed reflect the changes from wartime civilian motor fuel to that being sold at filling stations today.

Some changes in volatility qualities of summer gasolines are also evident. The average Reid vapor pressures were 8 lb. for both grades of motor fuel during the past summer, but had been several tenths of a pound under that figure during the summer of 1945 and several summers following.

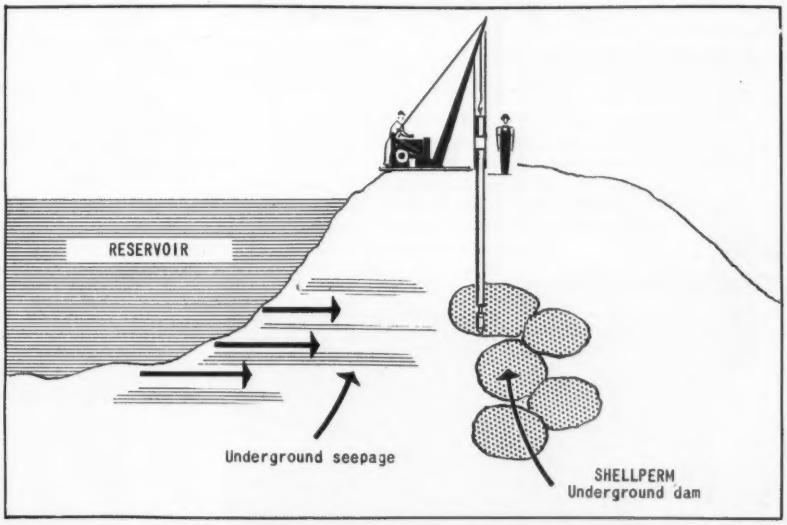
The distillation tests indicate more fully the trends in gasoline volatility. Average temperatures of the 10 per cent points have dropped some half dozen degrees during the past 3 years and in the present survey are 136° and 138° F. for premium and regular-price gasolines, respectively. At the 50 and 90 per cent points the two grades of gasoline have distillation temperatures well below those of summer 1945, but, as shown on the chart, have somewhat higher temperatures in 1948 than during the two preceding summers. Temperatures at the 50 per cent evaporated points in the present survey are 228° and 238° F., and at the 90 per cent points are 335° and 343° F. for premium and regular-price fuels, respectively.

This survey, made under a cooperative agreement between the American Petroleum Institute and the Bureau of Mines, U. S. Department of the Interior, as a continuation of a series of semiannual reports made for winter and summer seasons since 1935.

Data for the 17 marketing districts of the United States in total represent 2,997 samples of motor gasoline. The samples were tested in the laboratories of 25 oil and motor companies which collected them from filling stations in 207 cities and towns throughout the country. The motor fuels are the products of approximately 115 companies, who market gasoline.

R.I. 4444 includes charts for both winter and summer seasons which show the trends of octane numbers, Reid vapor pressures, and certain distillation points of the two grades of gasoline for the entire series. A free copy of the report may be obtained by writing to the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh.

*Associate petroleum chemist, U. S. Bureau of Mines. Material from U.S.B.M. Report of Investigations 4444.



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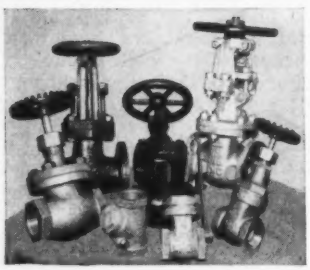

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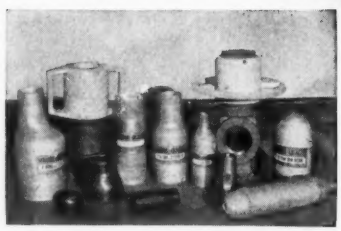

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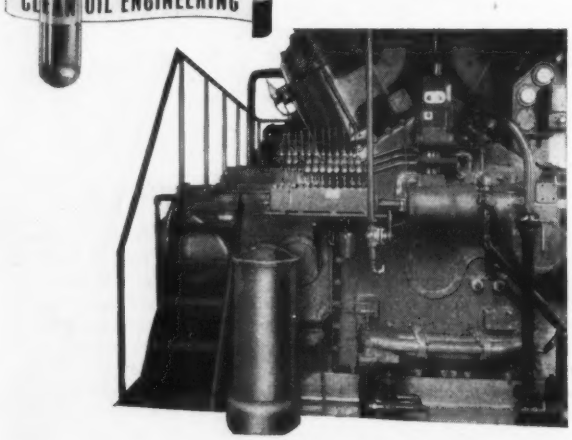

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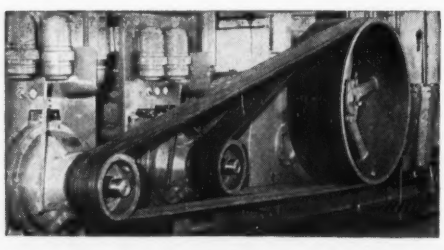

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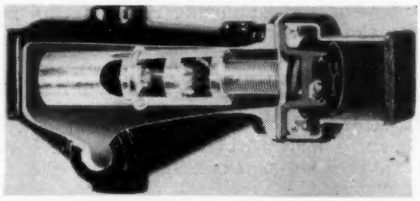
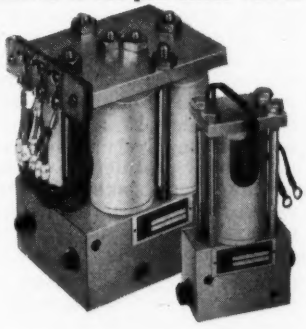


bottom, and on each side assure easy external installation. An outstanding special seal between the sylphon bellows and the switch housing prevents oil leakage even if the sylphon bellows should rupture. *McDonnell & Miller.*

IT'S NEW ✓ CHECK IT

(2) HIGH PRESSURE SOLENOID VALVES for hydraulic systems with operating pressures to 300 psi. These valves are available in either two-way, three-way, four-way, normally open, or normally closed type. They occupy a minimum of space and poppet-type construction locks fluid in one direction, eliminating leakage. Free flow is admitted in the other direction. Electrical requirements are any voltage from 6 to 36 volts d.c. *Waterman Engineering Co.*



IT'S NEW ✓ CHECK IT

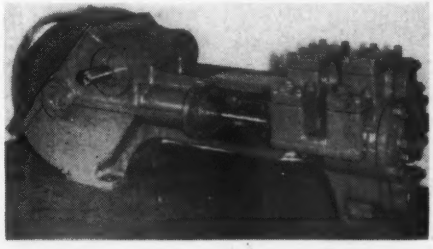
(3) ZEROLITE LOW-TEMPERATURE INSULATION with exceptional fire and chemical-resistant qualities, available in the form of sheets, lagging, and pipe insulation. Especially designed for service within the temperatures of —400° F. and +25° F. Made of mineral wool and a resin binder, Zerolite is an inorganic material that combines high fire resistance, immunity to many organic solvents, and excellent moisture resistance with low heat conductivity. The many organic solvents to which Zerolite is immune include benzol, methyl ethyl ketone, and petroleum fractions and derivatives. It shows a moisture absorption of 0.0. after 96 hours in air of 75 per cent relative humidity, and a water absorption of only 2.0 per cent by volume after being submerged for 24 hours. The low heat-conductivity values at several mean temperatures are 0.28 at 70° F., 0.25 at 0°, and 0.22 at —70° F. *Johns-Manville.*

IT'S NEW ✓ CHECK IT

(4) ELEVATION METER determines differences in elevation between geographical points that can be reached by automobile. It is a direct-reading electronic device which integrates the instantaneous values of the path length and the sine of the path inclination to give the accumulated change in altitude. The instrument is carried in a car with a three-wheeled trailer. By starting at a known or assumed altitude, the elevation of any desired point can be determined directly by driving to this point. It is capable of furnishing elevation differences to a fraction of a foot. The precision depends on the operational techniques employed. Speeds up to 25 m.p.h. can be maintained, depending on road conditions. *Sperry-Sun Well Surveying Co.*

IT'S NEW ✓ CHECK IT

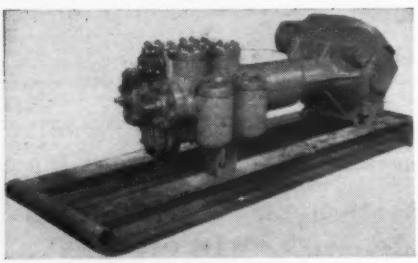
(5) TWO DUPLEX RECIPROCATING PUMPS. Called the "Economy Special," the Wheatley 1800 series come



The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

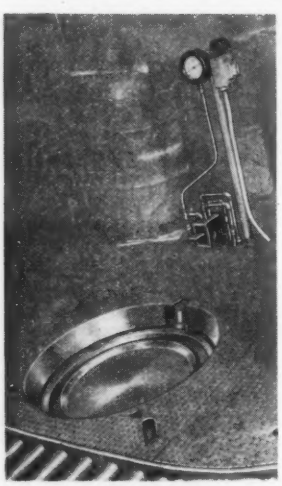
in sizes from 2½ to 4 by 6 in. They are V-belt driven and can pump 162 bbl. per hour at 350 psi. running at 90 r.p.m. Weighs 1,350 lb. Particularly adapted to partially abandoned properties where only one or two wells



are still pumping. Second new Wheatley line, featuring round valve pots for higher pressures and volumes, is the series 6000. This line comes in 2½ to 5 by 10 in. and 4 to 7 by 10 in. sizes, V-belt driven. With semisteel fluid end, 1,920 lb. working pressure is possible, using the 2⅜-in. liners. *Frank Wheatley Pump & Valve Manufacturer.*

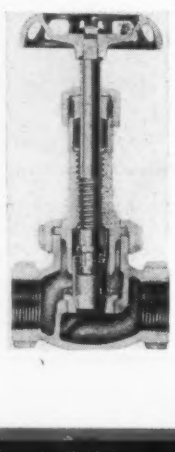
IT'S NEW CHECK IT

(6) STEEL DRUM CONDITIONING MACHINES. Two new machines designed to recondition steel drums after hard usage, designed by Meisenheimer, Dryer & Associates. One of the machines is a wire brusher which combines complete facilities for brushing the entire external surface of steel drums in one rapid, thorough operation. The other (pictured) is a chime reformer which removes all chime deformities and returns the drum to perfect circular shape. The brushing machine is capable of cleaning all external, exposed, and unshielded drum surfaces in one brushing action operation consuming from 8 to 10 seconds per drum. *The Osborn Manufacturing Co.*



IT'S NEW CHECK IT

(7) PLUG-TYPE BRONZE GLOBE VALVE for 300-lb. service, especially suited to severe services such as pressure regulation, steam-control bypass lines, temperature regulation, apparatus throttling, bleeds, drips and drains, soot blowers, continuous blowdowns, or any other close regulation of steam. One feature of this new valve is the armor seat and slip-on, stay-on plug. Plug and seat ring make combination which is practically impervious to wear. *Jenkins Brothers.*

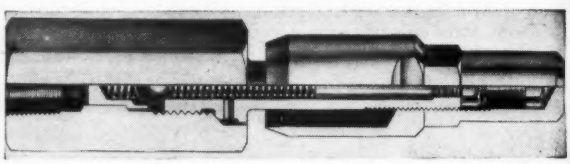


IT'S NEW CHECK IT

(8) OMEGA EXPANSION JOINT. Pipe-line movement, axial, lateral, transverse, or vibratory, is taken up uniformly by each self-equalizing corrugation. Stresses and fatigue rate are negligible. Compression occurs under lower applied thrusts and corrugations can function only within the elastic limit for which they are designed. By incorporating a circular cross-section in Omega design, the possibility of distortion is eliminated. Pressure merely puts the metal under tension. Side walls of corrugations need not be depended upon to limit movement and equalizing rings are not necessary. *Marquette Coppersmithing Co.*

IT'S NEW CHECK IT

(9) AIRLARM is a low-pressure warning device which sounds a shrill alarm when the pressure in any compressed air system or line falls below the minimum pressure for safe or efficient operation. For oil-field use, Airlarm is particularly desirable for drilling rigs



where air-operated clutches and brakes are used on draw works, preventing wear on clutch faces, brake drums, and lining when the air supply falls below the required pressure. It is an excellent safety device on rigs using air-operated pumps for operating blowout preventers. Airlarm is completely mechanical and fully automatic. The unitary assembly consists of a valve element which springs open when the air pressure drops below some preselected valve and allows the escaping air to blow an integral whistle. This alarm continues to sound as long as the air pressure is less than that for which the valve is set. As soon as the pressure returns to a valve above the set point, the valve automatically closes and the whistle stops blowing. *Airlarm.*

IT'S NEW CHECK IT

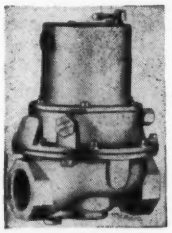
(10) MINERALIGHT MODEL H ULTRAVIOLET LAMP. Performance equals in many respects that of the larger Mineralight units. Petroleum engineers have found it to be a quick means of identifying core samples. The

ultraviolet tube has long life and the lamp is equipped with a Woods filter. Unit operates on 110 volt a.c. from standard electrical plug-in connections. *Ultra Violet Products, Inc.*

IT'S NEW CHECK IT

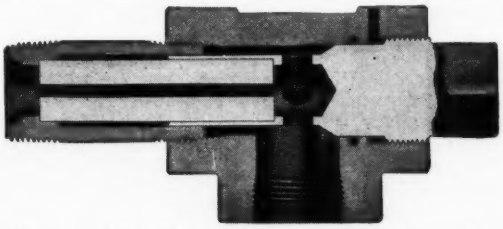
(11) ELECTRIC DIAPHRAGM GAS VALVE, designed for reliable control of natural, manufactured, mixed,

and liquefied petroleum gases to space and unit heaters; central, floor, and wall furnaces; and boilers. Valve is silent, has no packing glands or bellows to impede operation. Low current consumption of 5 watts. For low or line voltage applications. Standard model and manual-opening model with or without electric trip. Envelope size of valve makes it easy and simple to adapt to any gas-fired-heating installation. Packless construction. All body parts die-formed aluminum of high density and tensile strength. Two small sizes, ⅜ in. and ½ in. i.p.s., diameter 2¾ in. Two medium sizes—½ in. and ¾ in. i.p.s., diameter 3⅞ in. and three large sizes, 1 in., 1¼ in. and 1½ in. i.p.s., diameter 5¼ in. *General Controls Co.*



IT'S NEW CHECK IT

(12) POSITIVE PRODUCTION CHOKE, positive bean with cage nipple assembled in a screw type tee body, and an A.P.I. flanged-type tee body fitted with the adjustable assembly. The positive or adjustable units can be interchanged in either housing, so that a well may be washed in, through the adjustable choke assembly which may then be replaced by a positive choke assembly for producing the well. Note that the bean retainer fits snugly over the bean so that it is automatically retrived when the retainer is backed out of the choke body. *Cameron Iron Works.*

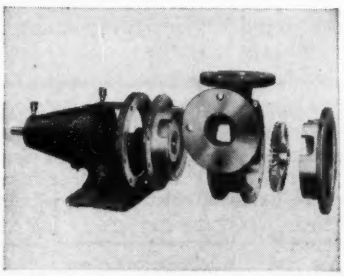


IT'S NEW CHECK IT

(13) COMBINATION AIR INTAKE CLEANER-SNUBBER can be used on all 2 and 4-stroke-cycle stationary engines (diesel, gas, or dual fuel). Can also be used for the intake of all centrifugal and positive displacement compressors and blowers requiring a compact combination intake air clearer and snubber. These units are available in pipe sizes from 8 to 30 in., inclusive. Unit combines intake air cleaning and noise prevention. Snubber replaces an intake snubber plus a supplementary intake air filter. *Burgess-Manning Co.*

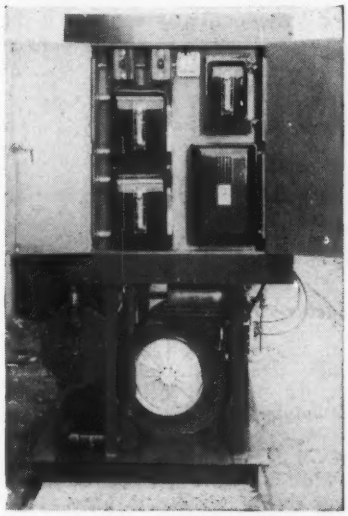
IT'S NEW CHECK IT

(14) IMPROVED TURBINE-TYPE PUMP. Develops pressures up to 175 lb. in single speeds of 1,750 r.p.m. and delivers capacities to 150 g.p.m. It is inherently self-priming and handles a certain amount of air and vapors without losing its prime or vapor binding. With flanged inlet and outlet, it is fitted with an extra-deep stuffing box, a single multivaned impeller, and an oversize stainless-steel shaft in double ball-bearing construction. The heads and impeller are easily removed for inspection or for replacement in case of wear. *Roy E. Roth Co.*



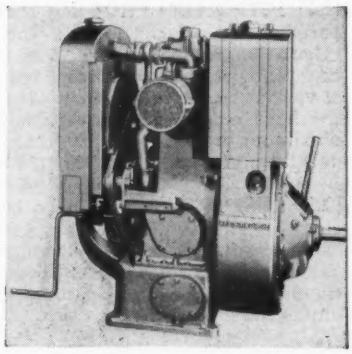
IT'S NEW CHECK IT

(15) AUTOMATIC BURNER, a completely self-contained, packaged combustion system. Available for both automatic and semi-automatic control, this new burner incorporates a complete system of fuel-oil pumping and oil preheating equipment, forced-draft blower, and wide-range constant-differential mechanical atomizing oil burner, mounted on a steel base. Only requirement in the field to complete installation of the automatic burner is the connection of service lines. Designed to fire boilers at capacities of 100 developed horsepower and upwards. *Peabody Engineering Corp.*



IT'S NEW CHECK IT

(16) DIESEL ENGINE, 10 hp. Known as Type 4FS-1, this new engine is an extra-heavy-duty vertical-type, four-cycle, single-cylinder, mechanical-injection engine. It has a 4½-in. bore and 5¼-in. stroke and is rated at 10 hp. at 1,200 r.p.m. and 15 hp. at 1,800 r.p.m. Production is expected in the near future of two and three-cylinder models of the same bore and stroke with proportionately higher horsepower ratings. The 4FS-1 engine is now available for immediate delivery. *Nordberg Manufacturing Co.*



IT'S NEW CHECK IT

(17) LIGHT-WEIGHT LUBRICATOR for running measuring line-operated instruments in wells under pressure. The lubricator consists of a tube of heat-treated aluminum alloy, 2-in. i.d. and any effective length to 20 ft. with heat-treated aluminum-alloy quick-connecting hinge and Unibolt coupling at the lower end, and a removable sheave and remote controlled packing-gland assembly

attached by Unibolt coupling at the upper end. Tube has a pressure rating of 4,102 psi. at 125° F. with safety factor of two. *Dale Co.*

IT'S NEW ✓ CHECK IT

TRADE LITERATURE

(18) CHLORINE SAFETY WALL CHART. Recommendations for safety in use and handling of liquid chlorine cylinders and ton containers. The 18 by 23-in. chart, printed in color on linen-backed paper, is suitable for hanging in places where chlorine cylinders are stored or used, lists recommendations for storage, handling, and use of liquid chlorine cylinders, as well as emergency, first aid, and prophylactic measures. *Hooker Electrochemical Co.*

(19) FLANGE DIMENSIONS. A 20-page illustrated booklet of flange dimensions based on A.P.I. standard 6B. *Oil Center Tool Co.*

(20) FABRI-STEEL SYNCHRONOUS GENERATORS. Illustrated and descriptive, the four-page folder concisely describes construction features of this newly designed generator. *Elliott Co.*

(21) TOTALLY ENCLOSED FAN-COOLED MOTORS, with tube-type air-to-air heat exchangers are described in a new four-page bulletin, showing details of units available in squirrel-cage, wound rotor, and synchronous types, for vertical or horizontal installations. *Allis-Chalmers Manufacturing Co.*

(22) FORGED-STEEL UNIONS. This booklet lists the latest specifications on all items together with photographs and diagrams. *Clayton Mark & Co.*

(23) STEELCRAFT WORKBOATS. Stock workboats especially designed for the oil industry's marine use. The folder consists of quasi-blueprint profiles and deck plans, together with full specifications of seven models of stock Steel Craft workboats in three sizes ranging from 20 to 35 ft. *Churchward & Co.*

(24) PETROLEUM PRODUCT PUMP. A brochure prepared on 12 pages and in 2 colors, presents important calculation tables, including a table of viscosities for different petroleum products with the viscosities shown at various temperatures from 40° to 100° F.; a table giving the head equivalents of various liquids and another of maximum practical suction lifts at various temperatures and from sea level to 2,500 ft. altitude. *Marlow Pumps.*

(25) RUST-OLEUM. A 16-page brochure with full color chart, together with recommendations for coatings applicable to surfaces exposed to different deteriorating elements. Lists coatings developed for heat resistance, chemical, and weather resistance; floors; machinery, and implements. *Rust-Oleum Corp.*

IT'S NEW ✓ CHECK IT

(26) VAPOR CONSERVATION WITH BREATHER BALLOON. Folder describes causes of vapor losses, desirability for conservation of petroleum vapors, and completely illustrated description of operation of the breather balloon. *Vulcan Proofing Co.*

(27) EVERYWHERE IN THE WORLD. A four-page folder reproduces photographically all the parts of the sand pump manufactured by the company with specifications of each part. *Miller Sand Pump Co.*

(28) DEPTHOMETER, a fast, efficient wire-line measuring device for swabbing, bailing, cleanout, single-shot surveys, and similar sand-line or drilling-line operations, completely explained in two-color folder. *Cavins Co.*

(29) FUEL-OIL PUMPING AND HEATING UNITS. A 16-page fully illustrated brochure with details of construction, diagrammatic drawings, specifications, and conversion tables. *National Airoil Burner Co., Inc.*

(30) GLASS FIBER WRAP. A brochure describing the properties and corrosive resistance of glass-fiber wrap applied on underground pipes, including tables on quantities required per mile of pipe for various diameters. *Oklahoma Glass Fiber Corp.*

(31) PETRECO ELECTRIC DESALTING. Booklet contains a general account of salt problems and their solutions. It is well illustrated with charts, photographs, schematic drawings, and graphic examples of operational benefits effected by this process. *Petroleum Rectifying Co.*

(32) FLO-MASTER TRIPLEX SLUSH PUMPS. Includes diagrammatic drawings, capacities, specifications, cutaway photographs, and details on entire unit. *International Derrick & Equipment Co.*

(33) SAFE IN HAZARDOUS LOCATIONS is the title of a bulletin on explosionproof motors designed especially for fume-laden atmospheres. Describes savings in installation cost of motors, and insurance and maintenance cost. Well illustrated with sectional drawings. *Allis-Chalmers Manufacturing Co.*

(34) TUBEFLOW SECTION HEAT EXCHANGER. A 12-page bulletin explains exclusive design by which heavy viscous or sediment-bearing liquids are carried completely through unit without fouling; and describes several instances in which sections are continuing to maintain rated capacity on services where conventional types of heat exchangers caused trouble. *Griscom-Russell Co.*

(35) RUBBER-MOUNT SPEED STAR. A full description of the No. 72 drilling machine with capacities and specifications. Illustrated in detail, the folder gives a concise picture of the capabilities and advantages of this unit. *Star Drilling Machine Co.*

(36) ADJUSTABLE PIPE HANGERS AND SUPPORTS. A 90-page dossier includes complete specification, application, capacity, and illustration of each item. Lists 132 designs of hangers, supports or related items, and includes hanger-load calculations. *Grinnell Co., Inc.*

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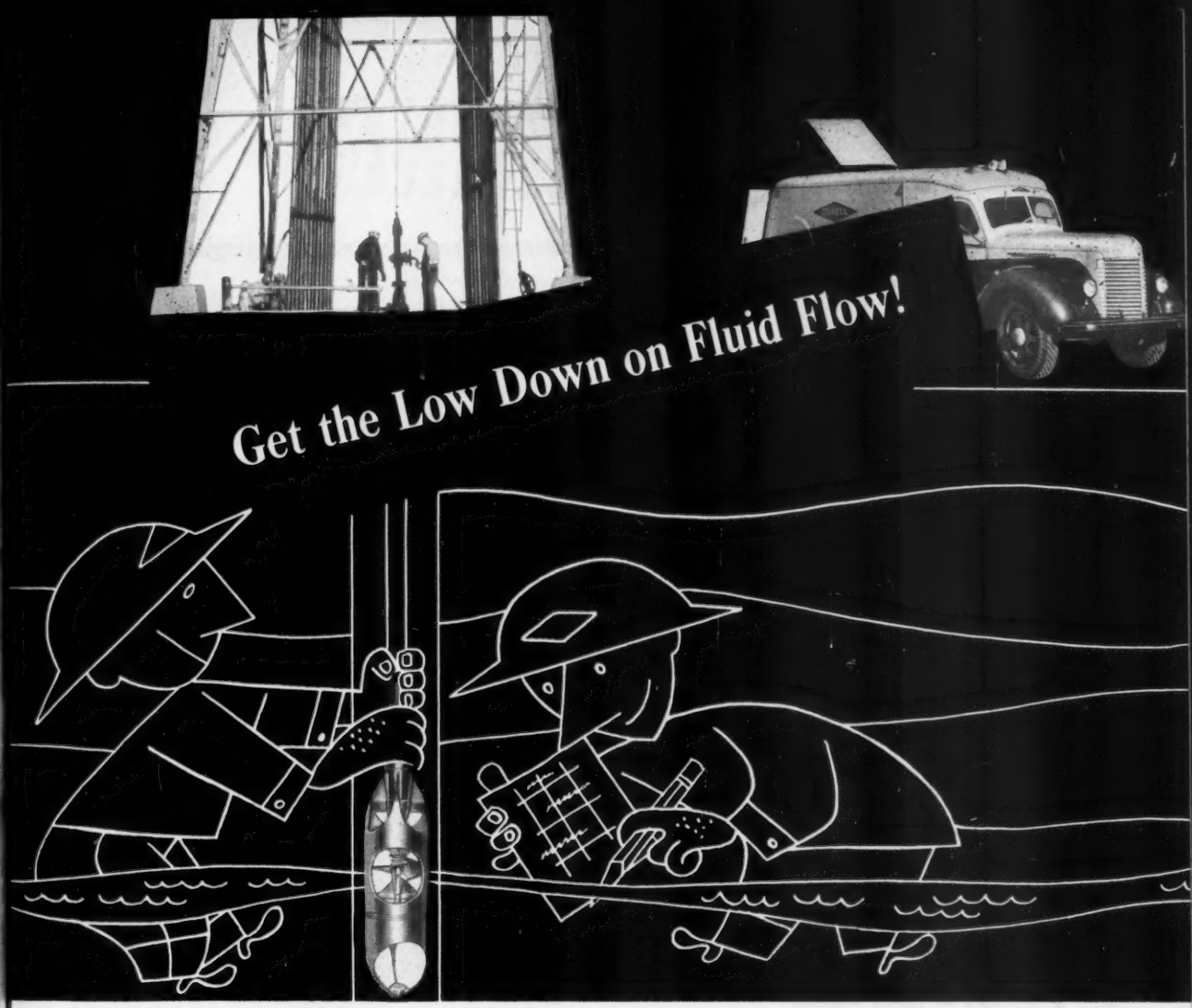

DOWELL SPINNER SURVEYS locate and measure fluid movement from and into formations

The Dowell Spinner, an efficient subsurface flow rate indicator for well fluids, is specially engineered to give you practical information about your oil or gas well. The small propeller is turned by fluid passing it in either direction, as the fluids are produced or injected. An automatic counter in the Electric Pilot truck records the revolutions, and these readings are easily converted into gallons per minute.

Dowell Spinner Surveys may be used: (1) to measure the relative permeability of the zones exposed in producing or input wells. (2) to determine the relative production of zones in a producing oil or gas well. (3) to locate zones of lost circulation, holes in pipe and leaks in casing seats and bottom hole plugs.

Call your nearest Dowell Station for complete information about the application of a Spinner Survey to your well.

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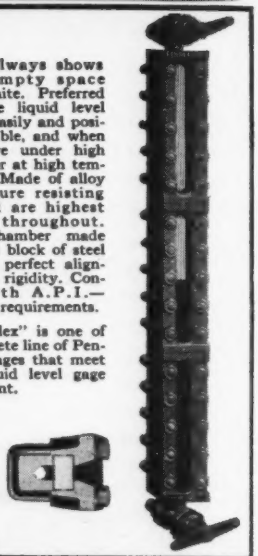
The "Reflex" is one of the complete line of Penberthy Gages that meet every liquid level gage requirement.



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REFINING

Radioactivity Applied to Petroleum Processes

Radioactive piston rings and applications of radioactive isotopes have recently been used by the California Research Corp., subsidiary of Standard Oil Co. of California, and the Isotopes Division of the Atomic Energy Commission for studies of engine wear, fluid travel in pipe lines, and the progress of hydrocarbon molecules in the manufacture of gasoline. These new applications of radioactivity are reported as simple and accurate.

Piston rings are made radioactive by irradiation in a chain-reacting pile and are used in an engine. As little as one-millionth of an ounce of metal worn from the rings may be measured by a very simple method. In the experiments relating to the production of petroleum fuels, a carbon atom in a molecule of the hydrocarbon being studied is replaced by a radioactive carbon atom. The progress of the molecule through the refining processes may then be traced by use of a Geiger counter.

Pipe-line operation is simplified by the addition of a small amount of radioactive barium to the fluid being pumped. The arrival of the barium-bearing oil sample at any point may be instantly determined by a Geiger counter held near the pipe. In this manner the radioactive material will serve as a marker in mixed-products lines. As little as one-billionth of an ounce of the isotope can be used for efficient control of the fluid flow.

The half-life of the isotopes used for tracers is so short that no radioactivity would be present in products sold to consumers. Radioactive isotopes from the Oak Ridge laboratory are being supplied for experiments in biological, medical, and agricultural fields.

New Aldehydes From Petroleum by Oxo Process

Six new chemicals from petroleum were announced this week by Rohm & Haas Co. of Philadelphia. All are derivatives of nonyl aldehyde, obtained currently on a pilot-plant scale by oxonation of diisobutylene, carbon monoxide, and hydrogen.

The new chemicals include: nonanoic acid, nonylamine, nonyl aldehyde cyanohydrin, octadecenyl aldehyde, alpha-hydroxy-decanoic acid and octadecyl alcohol. Their synthesis marks the first production by the Oxy process, of aldehydes. Alcohols and their derivatives are produced commercially from oxonation of petroleum hydrocarbons by Standard Oil Development Co. at Baton Rouge, La.

Refining Capacity Is 10 Per Cent Over Requirements

Expansion of refining capacity in the past 2 years has resulted in surplus capacity running approximately 10 per cent above the recent peak production requirements, the National Petroleum Council's committee on petroleum refining capacity, headed by Dr. Robert E. Wilson, chairman of the board, Standard Oil Co. (Ind.), reported recently.

Estimated daily refining capacity of the operable refining units of the United States as of December 31, 1948, according to the council report, totaled 6,346,900 bbl. A previous report of March 31, 1947, totaled 5,588,402 bbl. indicating an increase in capacity over a period of 21 months, of nearly 14 per cent. Additions in 1949 wil add another 3½ per cent over the December 1948 figure, it was estimated.

Relating to refining operating costs, Dr. Wilson pointed out that, "most concerns feel that they get the lowest average cost when they operate at 100 per cent of capacity, but when you have material of widely varying ages and efficiencies, that is not true. I am confident that to go above 90 per cent in our industry, realizing the type of units we have brought into operation, we would increase rather than decrease average costs."

The expansion of refining capacity "was done very largely by the five billion dollars that the oil industry invested in expansion of facilities, and if we had had an excess profits tax, during that period, it could not have been done," Dr. Wilson explained.

New Chemical Speeds Up Cold-Rubber Process

A newly discovered chemical known as Diox has speeded up the cold-rubber process tremendously, it was reported recently by Dr. W. B. Reynolds, of Phillips Petroleum Co., Bartlesville, Okla., in a recent address before the Washington Rubber Group.

Through the use of "cold" rubber

and a new type of high-abrasion furnace black, tire treads superior to those formerly manufactured have been developed.

According to Dr. Reynolds, cold rubber can be made at 14° F. in only 75 minutes in contrast to the usual 12 to 16 hours. At the extremely low temperatures of —4° F. rubber can be made in only 5 hours with Diox as contrasted with 25 to 30 hours required previously at that temperature.

"The discovery of Diox marks a noteworthy achievement in the science and technology of synthetic-rubber production," Dr. Reynolds stated. "These Diox emulsion polymerization systems are inherently perhaps 300 times as fast as the synthetic rubber system we were using during the war."

Sinclair Refining Group Reviews Plant Operations

A 5-day conference at Harvey, Ill., for the purpose of reviewing refinery operations of Sinclair Refining Co. during the past year brought together technical and operating men from five of the company refineries recently.

The conference, which was sponsored by T. B. Kimball of the New York office, technical assistant to the vice president in charge of manufacturing, considered primarily operational difficulties connected with petroleum cracking units, the maintenance procedures of these units, and recent developments in cracking with catalysts.

Government Ammonia Plant Being Moved to Houston

HOUSTON. — Erection of a large government ammonia plant at the San Jacinto Ordnance Depot in this city is expected to begin within the near future.

The plant will make anhydrous ammonia from natural gas and air. Hercules Powder Co. has the contract to operate the plant which is being moved to Houston from Louisiana, Mo.

Girdler Corp., Louisville, has the dismantling and erection contracts. Pfeiffer Electric Co., La Porte, is electrical contractor, and Tellepsen Construction Co., Houston, is building a railroad spur for the plant.

Wage Strike Closes Petrochemical Plant

HOUSTON. — The $30,000,000 Carbide & Carbon Chemicals Corp. plant at Texas City has been completely closed down by a strike of 1,400 workers seeking a 27-cent an hour wage increase.

The plant is one of the largest of the Gulf Coast petrochemical manufacturing plants. Products include butanol, vinylite resins, ethylene amines, and ethanol.

Tests Show Advantage of High-Compression Engines

High-compression test engines for use by oil companies in studying future automobile fuels in the hope of developing fuel savings up to 40 per cent will be supplied by General Motors Corp., it was announced recently.

Extensive tests by G.M. have shown that the V-8 12-to-1-ratio engines have traveled as much as 40 per cent farther on a gallon of 100-octane gasoline than regular model engines using present 78-80 octane fuels, it was reported by Charles L. McCuen, general manager of G.M.'s research laboratories.

Considerable cooperative work by refining and automobile companies is necessary, he said, before such improvements will be available to the public.

Texas City Products Lab

HOUSTON. — A reserve quartermaster's petroleum products laboratory will be sponsored by Pan American Refining Corp. at Texas City as a part of the army's affiliation program.

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NATURAL GAS

Third Bill Is Introduced To Amend Natural Gas Act

WASHINGTON.—A bill to amend the Natural Gas Act to insure that independent producers and gatherers are exempt from Federal Power Commission jurisdiction was introduced in Congress last week by Rep. Oren Harris of Arkansas, the third measure dealing with the gas act to be introduced so far this session.

One of the other bills, introduced by Rep. John E. Lyle of Texas, is aimed at the same objective, and the third, sponsored by Rep. James I. Dolliver of Iowa, the same measure he offered in the last Congress, would establish a policy for administration of the Natural Gas Act.

All three measures have been referred to the House Interstate Commerce Committee for consideration.

United Natural Rate Hearing Set for March 1

The Federal Power Commission has scheduled a hearing to begin March 1 in the proceeding involving the investigation initiated by the commission of the rates charged by United Natural Gas Co., Oil City, Pa., for sale of natural gas subject to FPC jurisdiction.

The Public Service Commission of New York recently advised FPC that Iroquois Gas Corp. of Buffalo, N. Y., which receives more than 80 per cent of its gas from United Natural, proposes to increase its rates. The state commission asked FPC to institute "such action as may be necessary to fix just and reasonable rates for the gas supplied by United Natural to Iroquois."

N.A.C.E. Meeting Offers Session on Gas Problems

National Association of Corrosion Engineers has tentatively announced the titles of 41 of the 42 technical papers scheduled to be delivered at its 1949 conference at Cincinnati, April 11-14.

Hightlight of the conference will be a symposium on the gas industry which will include "Cathodic Protection of Gas Distribution Systems," A. W. Peabody and C. L. Woody, Ebasco Service, Inc.; "Preparation of Reconditioned Pipe Surfaces for Effective Application of Bituminous Coatings," O. C. Mudd, Shell Pipe Line Corp.; "The Use of Thermo Generator for Cathodic Protection," H. J. Findley, Eaton Manufacturing Co.; and "Field Tests of Sodium Chromates and Alkalies for Controlling Corrosion in Gas-Condensate Wells," C. Kenneth Eilerts, Bureau of Mines.

On April 11, two papers will be delivered during a symposium on corrosion principles; April 12, four papers for the chemical industry symposium and four papers on electrical and communications industries symposium; April 13, four papers on Cathodic protection symposium, three papers on pulp and paper industry symposium, four papers on general industry symposium, and four papers on transportation industry symposium; and April 14, four papers on protective coatings symposium, four papers on oil industry symposium, four papers on salt water corrosion symposium, and four papers on gas industry symposium.

Southern Natural Seeks Interest in Coastal's Line

WASHINGTON. — Plans for acquisition by Southern Natural Gas Co. of up to 125,000 shares of the initial authorized common capital of Coastal Pipe Line Corp., organized for the purpose of constructing a pipe line from Texas to the Atlantic Seaboard, have been submitted to the Securities and Exchange Commission for approval.

The maximum number of shares to be acquired by Southern would represent one-half of Coastal's common stock, and would be acquired at the par value of $1 per share.

Southern also announced that it plans to file a proposal with the SEC for disposition of its public - utility subsidiary companies and a subsequent request for an order declaring it to have ceased to be a registered holding company. Participation by the company in the new venture is conditioned upon such an order and, if it is not issued by the commission, the Coastal stock will be offered to other Coastal stockholders at the best price offered by outside interests.

The gas company explained that it desires to supplement its present source of supply by gaining access to fields in Texas. In consideration of its acquisition of the 125,000 shares, Coastal has agreed to make available 100,000 M.c.f. of gas daily at reasonable prices from any pipe line constructed by it if Southern is unable to obtain an SEC order declaring it not to be a holding company.

Emergency Use Suggested For Portable Gas Turbines

Portable gas-turbine electric power plants mounted on railway cars and capable of producing between 3,500 and 5,000 kw. for use in disaster-stricken areas, was suggested by Brainard G. Hatch, turbine engineer for General Electric Co., in an address before the local chapter of the American Institute of Electrical Engineers at Washington, D. C.

Burning either natural gas or Bunker C oil as fuel, the gas turbine utilizes hot gases to drive the shaft which in turn drives a generator to produce electric power. Six of the turbines are now being constructed by General Electric; three will be operated on natural gas and three will use Bunker C oil.

Gas Revenues Show 19.7 Per Cent Gain in November

Operating revenues of natural-gas companies reporting to the Federal Power Commission totaled $76,815,057 in November 1948, a gain of 19.7 per cent over the $64,158,902 reported for the same month a year ago.

For the 12 months ended November 30, 1948, gas operating revenues aggregated $841,293,362, an increase of 15.2 per cent over the total of $730,010,443, reported for the 12 months ended November 30, 1947. Net income for the period ended November 30, 1948, amounted to $158,956,864 and represented an increase of 7.6 per cent over the previous 12-month period.

Gas sales to ultimate consumers in November 1948 were 135,114,000,000 cu. ft., an increase of 20.5 per cent over November 1947. Sales to residential consumers increased 19.8 per cent and to commercial and industrial consumers 17.8 and 19.7 per cent, respectively. Revenues from sales to ultimate consumers increased 20.2 per cent and amounted to $40,224,941. Revenues from residential and commercial consumers were up 16 per cent and 16.7 per cent, respectively. Revenues from industrial consumers were up 26.1 per cent.

Gas-utility operating income for November 1948 amounted to $13,887,-335, up 35.3 per cent from the $10,264,-336 reported for November 1947. Net income for the month was $14,690,354 compared to $11,314,352 reported for November 1947.

Carter to Supply Gas

Carter Oil Co. has made arrangements to supply gas to Vandalia, Ill., which was left without heating facilities early last week following the explosion of a butane gas-mixing plant, the city's source of supply. Carter will draw on gas from Loudon field to carry out its emergency supply plan.

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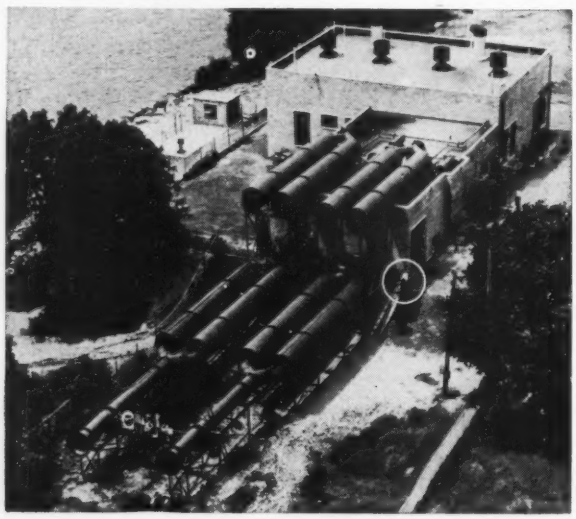

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Active-Rig Totals Register Decline

A rather sharp reduction in the active rotary-rig totals for recent weeks has been noted over the totals for a similar period in December. A part of this drop is undoubtedly due to inclement weather in most of the oil-producing areas. It is difficult to determine if the totals will remain at this level, however.

The totals for 2 weeks in January are given below:

	Jan. 10	Jan. 17
Pacific Coast	176	177
Oklahoma and Kansas	355	340
Rocky Mountain (inc. W. Canada)	209	198
Ark., La., Texas	182	176
West Tex., and N. Mex.	593	555
Gulf Coast	542	565
Illinois	132	144
Total	2,158	2,103

Guy Maybee has contract for Plymouth Oil 1 V. B. Sims, in SW of Section 8, Block 2, T&NO Survey, 12 miles south of Post in Garza County, Texas.

Woods Drilling Co. has started its 1 Crain, SW SW NE 8-13n-9e, in Okfuskee County, Oklahoma. This will be a 4,100-ft. test.

Meredith Drilling Co. will drill Mid-Continent Petroleum Corp. 1 Killen, in NW of B. Lewis Survey A-347, 3 miles south of Post Oak in Jack County, Texas. Contract depth is 6,500 ft.

Olson Drilling Co. and S. F. Hurlbut have made location for their 1 Ellwood estate, 660 ft. from north and west lines, SW ¼ Section 17, Block 13, J. P. Smith Survey, 12 miles southeast of Colorado City in East Mitchell County, Texas.

C. W. Cooper has contract for Tom B. Medders 1-B Smith-Hancock, in SW of Section 1, Block 1, H&TC Survey, in Archer County, 7 miles north of Scotland, Tex.

Aylward Drilling Co. and Bishop Oil Co. have staked location for their 1 Schrader, SW SW SE 4-22s-12w, between Drach and South Sittner pools in Stafford County, Kansas.

Mallard Drilling Co. and associates have location for 1 Crowther, SE SE NW 24-18s-1w, ½ mile south of the Battle Hill pool in McPherson County, Kansas.

Turner Drilling Corp. has contract for Pure Oil Co. E-6 State Beaver Creek, C W½ NW SW 18-25n-4w, Crawford County, Michigan.

Crew of Lunes Drilling Co., San Antonio, drilling Rock Hill Oil Co. 1 Martha Jonnie at Victoria, Tex. Joe W. Bates, tool pusher; O. D. Richardson; D. H. Gregory, driller; A. D. Gregory; C. C. Light; A. McDaniels; and M. B. Wood

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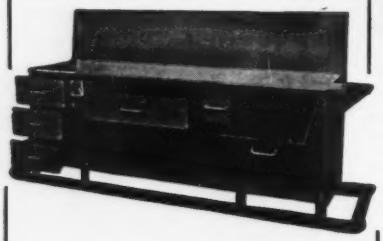

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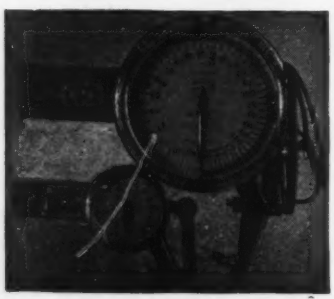

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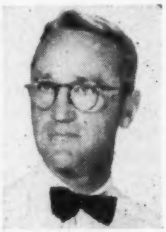
Circle Drilling Co., Inc., Lake Charles, La.

Growth.—Circle Drilling Co. was incorporated in April 1945. Management of the company since organization has been under direction of J. Geer Wilcox, vice president and treasurer. The first rig, a 5,000-ft. rig, was assembled in August 1945. The second rig, designed for 7,000-ft. drilling and equipped with a 94-ft. telescoping, truck-mounted derrick, was delivered in October 1945. This was replaced this past year with a 5,000-ft. rig equipped with a cantilever mast. Circle's third rig was purchased in December 1947 and commenced operations in January 1948. This rig is a diesel-powered job designed for 10,000-ft. drilling.



J. G. WILCOX

Equipment.—Two 5,000-ft. and one 10,000-ft. power rigs.

Personnel.—M. L. Vincent, Jr., president; L. Lee Welch, vice president; J. Geer Wilcox, vice president and treasurer; Drew Cornell, secretary; C. E. Bush, drilling superintendent; N. T. Johnson, tool pusher rig 1; P. C. Roberts, tool pusher rig 2; J. M. Sullivan, tool pusher rig 3, and J. K. Salter, chief mechanic.

Sidelights.—Commencing April 1, 1949, Circle's office will be located in the new Pioneer building in Lake Charles. . . In the words of J. Geer Wilcox, vice president and treasurer, Circle has encountered no unusual wells, "just the usual contractor's headaches of blowouts, cavities, and heaving shale." . . The company operates in South Louisiana and Mississippi. Rig No. 1 has worked for approximately 2 years for Continental Oil Co. in the St. Martinville field, Louisiana, drilling 5,200-ft. wells; Rig No. 2 has drilled 3,500-ft. wells and worked over deep wells in the Eunice, La., area; Rig No. 3 has drilled at 10,000-ft. depths for Bates & Cornell at Cankton, for Humble Oil & Refining Co. at New Orleans, and for William Helis at Baton Rouge, La., and in Mississippi. At present it is operating for Roeser & Pendleton, Inc., and Vincent & Welch, Inc., in the Bancroft area.

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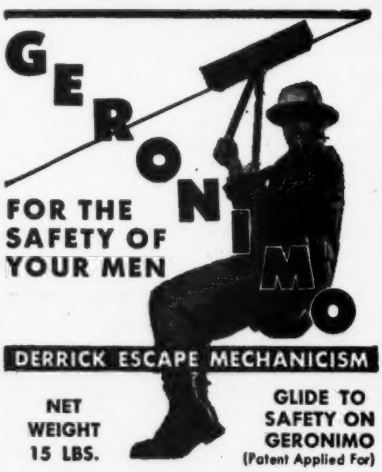

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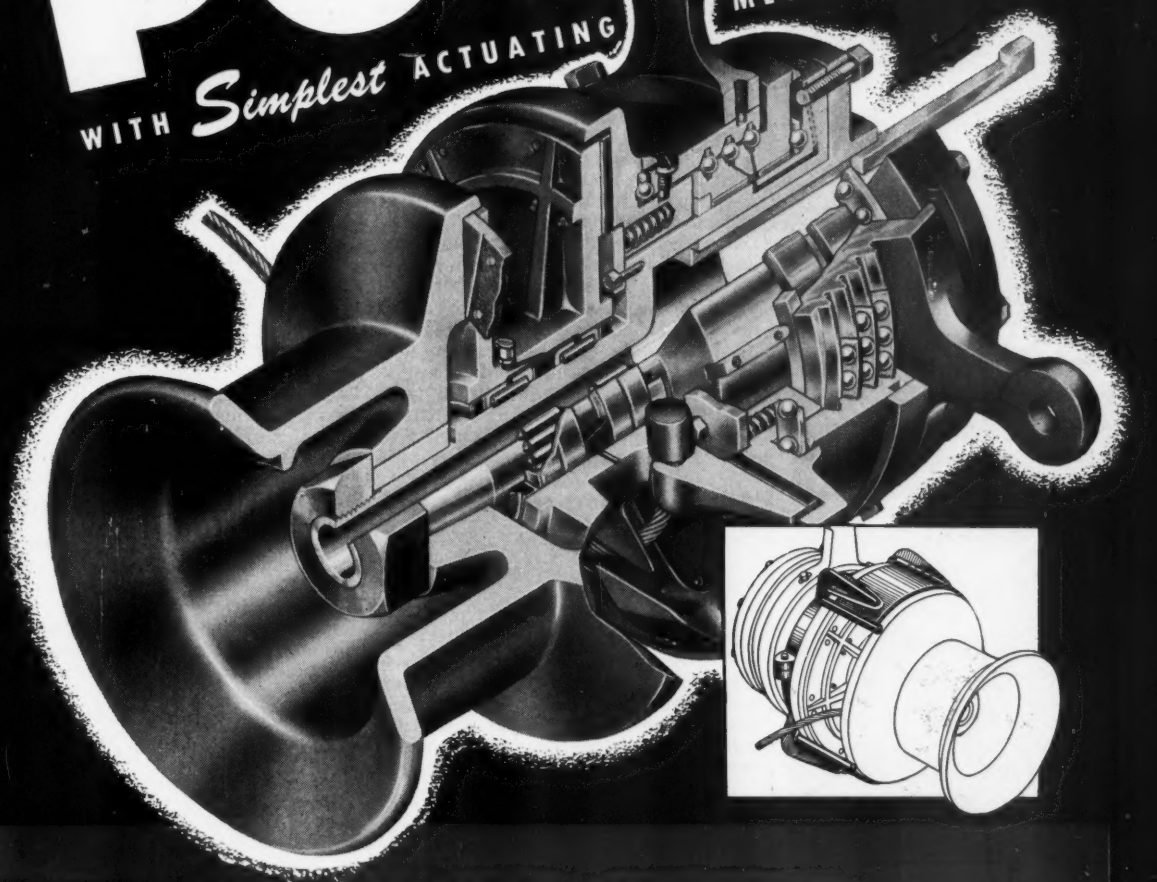

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PIPE LINES

Chilean Line Project to Start This Month

Construction of Chile's Tierra del Fuego crude-oil pipe line is expected to commence late this month, according to Luciano Claude, head of the department of power and fuels, Corporacion de Fomento de la Producion, Santiago, Chile. Orders for materials have been placed. It is expected that the pipe line will be completed in November 1949.

The project will consist of a 42.5-mile, 8-in. line from Cerro Manantiales (Springhill) and Caleta Clarencio (on Bahia Gente Grande). Regarding this project Williams Brothers Co. has prepared a complete engineering report, recommending the most desirable route, most economical size of pipe and type of pumping equipment. Construction will be done by Chilean personnel with the help of North American technicians.

Atlantic Progresses With 382-Mile Line

Atlantic Pipe Line Co. had laid up to the end of last week, 30 miles of 8-in. pipe for the start of the 382-mile, Refugio - Crane, Tex., crude-oil pipe line. Since the time when the project was started early in January there have been numerous interruptions due to bad weather. Under normal conditions pipe has been laid at rates varying from 8,000 ft. to 2 miles daily.

The entire project has been contracted by A. C. Holder Construction Co. which has a field office at Beeville, Tex.

In connection with operations for the cold application of coating, it is reported that the coating material is transported on the right-of-way in a 10-bbl. paint pot equipped with an agitator. For application to the pipe, a conventional cleaning and priming unit is utilized. Flow of material is controlled by a pump on the unit. Coating material is spread over the pipe by revolving rags.

West Virginia-Maryland Line Is Approved by FPC

Atlantic Seaboard Corp. and Virginia Gas Transmission Co., both subsidiaries of Columbia Gas System, Inc., have been granted Federal Power Commission authorization to construct additional natural-gas facilities to serve their existing utility customers in West Virginia, Virginia, Maryland, and the District of Columbia.

The proposed facilities include 268 miles of 26-in. pipe line extending from Clendenin, W. Va., to Rockville, Md., a multiple crossing of the Potomac River near Rockville, and additional measuring and regulating equipment at various points on the line. The portion of the line to be constructed in Virginia, about 75 miles, will be built by Virginia Gas. The 193 miles of line in West Virginia and Maryland will be built by Atlantic

Welding units of A. C. Holder Construction Co. near Refugio, Tex., engaged in construction of the 382-mile, 10-in. crude-oil line from the Gulf Coast to Crane, Tex., for Atlantic Pipe Line Co. In the foreground a welding machine, for a bell-hole welder, is hitched to a tow tractor. At the right is utility welding equipment mounted on a truck

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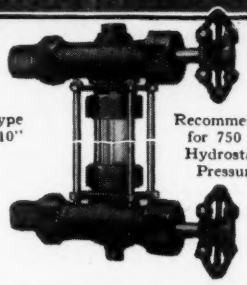
LIQUID LEVEL GAGES



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Seaboard. Total cost of the facilities is estimated at approximately $20,000,000.

The commission's order provided that the proposed new line, which will connect with Atlantic Seaboard's existing main line at Rockville, must be completed by March 1, 1950. The two companies jointly own and operate a 421-mile pipe line from Boldman, Ky., to a point on the Maryland-Pennsylvania state line near the Susquehanna River.

In issuing its order FPC pointed out that deliveries were authorized only to existing customers of the Columbia Gas System companies. The commission also severed the application of Tennessee Gas Transmission Co. which had previously been consolidated with the proceedings of the two Columbia System companies.

Lion Oil Extends Pipe-Line System

Lion Oil Co. has extended its system for moving crude oil to its refinery at El Dorado, Ark. Construction in 1948 included the laying of two lines by company crews: (1) 2.68 mile, 4-in. line connecting the new Cairo field to the existing 6-in., Shuler-El Dorado line in Union County, Arkansas; (2) 10.67 mile, 2, 3, and 4-in. connecting the new Bear Creek and Pace City fields in Ouachita County, Arkansas, to the Smackover-El Dorado 6-in. line.

The company has under consideration a project for the application of a special protective coating for crude-oil pipe lines in South Arkansas at a cost of approximately $80,000.

Price Co 's Toughest Job During 1948

In the course of building 511 miles of line (mostly 24 to 31-in. diameter) during 1948, H. C. Price Co. found that the laying of Southern Natural Gas Co.'s 35-mile, 24-in. loop was one of the toughest jobs handled by the firm.

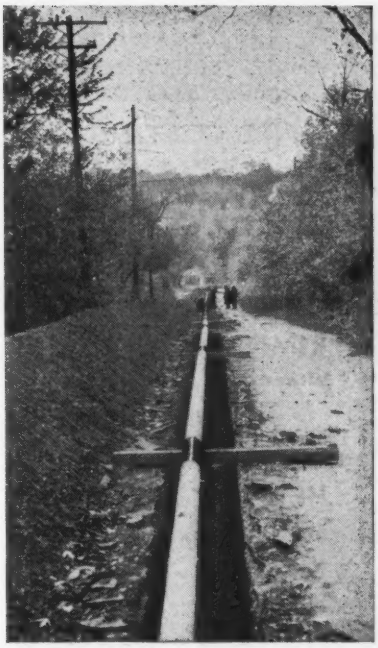
Approximately 400,000 lb. of dynamite was used on the project. The bending gang averaged 86 bends with 382 wrinkles per mile. Bends of 60° and 70° were not uncommon.

At repair shops at Houston, Tex., Natchitoches, La., Bessemer, Ala,, Princeton, Ill., and Bartlesville, Okla., equipment for five big-inch spreads is being overhauled by the Price company in preparation for 1949 season.

Motor Fuel From Pipe Lines Up 20 Per Cent in 1948

Motor fuel delivered from pipe lines in the first 11 months of 1948 amounted to 266,505,000 bbl., an increase of nearly 20 per cent over the same period of the previous year.

A total of 268,547,000 bbl. of motor



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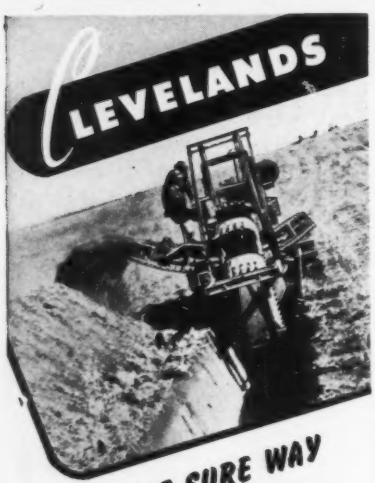

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fuel was turned into the lines in the first 11 months last year, and represented an increase of nearly 20 per cent over the same period of 1947.

Motor fuel delivered from the lines in November totaled 24,881,000 bbl., up 4,028,000 bbl. or 19.4 per cent from the year earlier month. Motor fuel turned into the lines for November totaled 24,790,000 bbl., a gain of 4,576,000 bbl., or an increase of 22.5 per cent from November 1947.

The ratio of motor fuel turned into the lines to total motor-fuel production was 32.02 per cent in the first 11 months of the year, compared with 29.2 per cent in the year-earlier period.

Buckeye Prepares for 82-Mile, 22-In. Line

In preparation for construction of the Lima-Toledo, Ohio, 82-mile, 22-in. crude-oil line of Buckeye Pipe Line Co., the Somastic Division of H. C. Price Co. is currently applying coating at a plant located at Findlay, Ohio.

At each of the four locations where coating is to be done, a 7½-acre site has been selected. Such sites have been selected at Findlay, Bowling Green, and Moline, Ohio. Early work was done at Wakeman, Ohio.

Under wet weather conditions encountered, it was found that regular types of stringing trucks and trailers were difficult to operate. Therefore, crawler-type wagons have been utilized. These are equipped with conventional bolster saddles. In spit of pipe-moving difficulties, coating operations have been conducted at the rate of 1,000 ft. per hour.

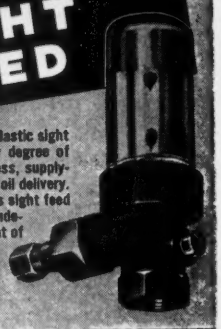
California Commission Approves 506-Mile Line

The California state public utilities commission last week approved the construction of 506 miles of natural-gas pipe line, for which Pacific Gas & Electric Co. is presently seeking Federal Power Commission authorization.

The 506-mile line is a portion of the 1,484 miles of pipe line, which will carry gas from the Texas-New Mexico area into the San Francisco Bay area. The California part of the line extends from where it crosses the state border at Needles, Calif., and Topock, Ariz., to the San Francisco Bay area.

Hearings on the applications of three natural-gas companies involved were scheduled to be resumed January 31 in San Francisco. Those companies concerned include El Paso Natural Gas Co., San Juan Pipe Line Co., and Pacific Gas & Electric Co. *(For additional details see The Oil and Gas Journal, January 27, page 359).*

McCORD "CLEARSITE" SIGHT FEED



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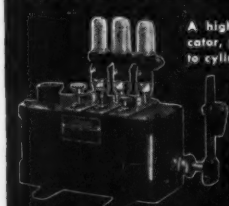

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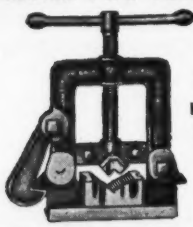

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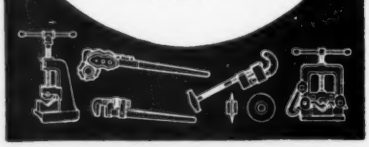

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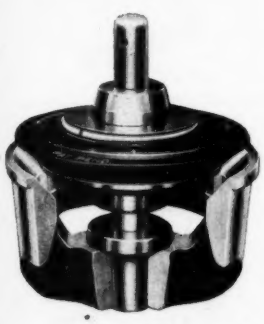

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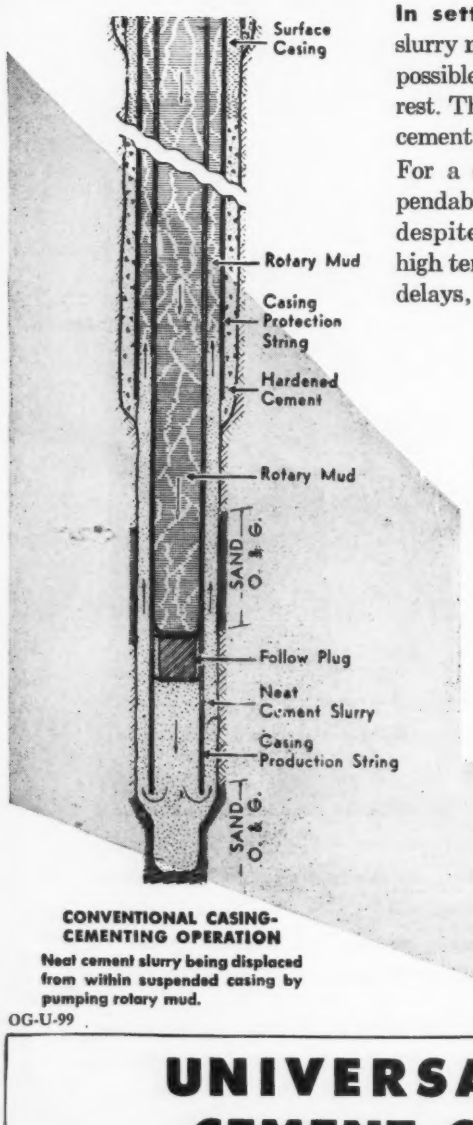

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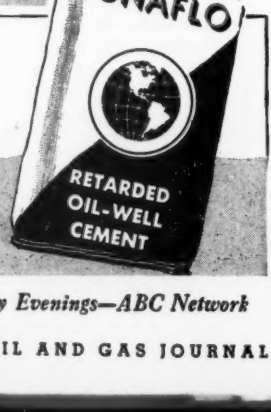

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Exploration and Drilling

Exploration Drilling in 1949

THE over-all pattern of the industry's plans for the 1949 wildcat drilling campaign is now available. *(See The Oil and Gas Journal, January 27, 1949, page 171).* It will probably come as a mild surprise to most people to find that the plans call for even more wildcats this year than 1948's record-smashing total of 6,877. A 2.6 per cent increase to a new record of 7,053 wildcat tests has been scheduled.

Since smaller operators drill more than 80 per cent of the wildcats, their combined programs obviously showed an increase. But the breakdown shows that what little difference there is, lies in a trend that has the 27 largest operators increasing their exploratory drilling a shade more, proportionally, than the smaller operators.

So far, then, weaknesses in refined products prices, and the 1948 cut in Pennsylvania crude prices have not impressed the operators as sufficient reason to curtail their search for new reserves. Nor have the cuts in state allowables, which were either in effect or clearly foreshadowed at the time the 1949 budget was made up. The data do show, however, that taking the different geographic areas, there is considerable selectivity in the 1949 campaign, as now planned. The over-all increase of 2.6 per cent is the result of decidedly different changes in the various areas.

The Rocky Mountain area of Utah, Colorado, Wyoming, and Montana is still considered a red-hot prospecting area. A 67 per cent increase in exploratory drilling is scheduled, a new high of 330 tests, compared to 198 in 1948.

Another outstanding change is that scheduled for eastern Texas. A 44 per cent increase in wildcats is on the program, an upping to 205 tests this year, compared to only 142 last year.

Michigan's 18 per cent increase is the natural followup to the big core-drill and leasing program carried on in the western part of the state following recent successful strikes there.

On the other side of the picture, the Permian basin area of West Texas and New Mexico is scheduled for the greatest curtailment. Here a 13 per cent cut is in the program. Only 336 exploratory tests are scheduled as compared to 385 last year. Probably the prospect of relatively heavy cutbacks in allowables because of lack of cheap transportation outlets is playing a part here.

In the Oklahoma-Kansas sector, a downward trend is on the program. The 1949 schedule calls for a decrease of 8.5 per cent, cutting back to 1,227 tests this year from a 1,341 total in 1948.

The southeastern area of Arkansas, North Louisiana, Mississippi, and Alabama reflects a downward trend. Their combined schedule shows a 5.5 per cent decrease; 325 tests this year compared to 343 last year.

The Gulf Coastal area, taking in southern Louisiana, Texas Gulf Coast, and Southwest Texas, is still considered pretty good hunting ground. The 1949 program is up 5.5 per cent over last year, 1,463 tests against 1,390 in 1948. North Central Texas and the Panhandle show the same increase, 5.5 per cent, up to 963 wildcats from 913 in 1948.

The Illinois basin area including Indiana and Kentucky, is almost unchanged; 1 per cent down. Appalachian area is 1 per cent up. California is up 2 per cent.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

PERMIAN BASIN.—Offset locations to the northwest and southwest at the Crossroads Devonian field, Lea County, New Mexico, have indicated flush production. Mid-Continent Petroleum Corp. 1 Dessie Sawyer, the northwest well, had a possible 400-ft. pay section, having recovered oil or oil-bearing cores from 11,806-12,207 ft. According to reports it is 400 ft. high, structurally, to the discovery. Lower Permian production was indicated at Magnolia Petroleum Co. 2-11 University, wildcat test between the Shafter Lake and Fullerton fields of Andrews County. Magnolia's 1-A TXL, Upton County, encountered salt water and was to plug back to start tests on the Ellenburger from 12,530-13,087 ft.

ARKANSAS.—Lion Oil Co. completed its 1 Story in Columbia County for 555 bbl. of oil a day in the Smackover at 8,426-33 ft., to open the new Pine Tree field, which has been given a daily allowable to 200 bbl.

ROCKY MOUNTAIN AREA.—Two wildcats in the Lodgepole area, Wyoming, have been abandoned and winter weather has delayed operations in most of the Rocky Mountain area. Stanolind Oil & Gas Co. is testing and will probably abandon the Spread Creek, Wyoming, wildcat at 7,581 ft., total depth. Shell Oil Co., Inc., failed on attempted tests in zones which showed staining at the Clear Creek, Wyoming, deep test.

CALIFORNIA.—Hancock Oil Co. confirmed its recent discovery in the Gosford area, Kern County, when its 83-23 Kern County Land, north follow-up well, found a thicker pay sand higher structurally than the discovery well. Superior Oil Co. of California hopes to set a new state drilling depth record at its 1 Limoneira, Ventura County test, which is currently drilling below 17,060 ft.

CANADA.—Anglo-Black Diamond 1, wildcat east of Turner Valley, encountered two good porous zones, and recovered gas and distillate on drill-stem test at 9,022 ft. Coring and testing will continue.

EASTERN TEXAS

Henderson County Test Preparing to Acidize

DALLAS.—Stanolind Oil & Gas Co. 1 Tom and Walton Deupree, Henderson County wildcat 5 miles southeast of Athens, prepared to acidize the Rodessa section through perforations at 10,222-78 ft., after making about 5,000 cu. ft. of gas a day when the testing tool was being pulled. Operators were runnning tubing after attempting to make the treatment through the testing tool. Total depth was 11,728 ft. in hard sand and shale, plugged back to 10,335 ft.

Phillips Petroleum Co. completed its 1 Miss W. J. McMinn, Long Survey, as a Rodessa discovery in South Tyler field of Smith County. Total depth was 10,017 ft., plugged back to 9,654 ft. On Railroad Commission potential, it flowed slightly more than 248 bbl. of pipe line oil through ¼-in. choke from perforations at 9,550-70 ft. in 24 hours. Flowing tubing pressure was 2,700 psi., gravity was 54.2°, and gas-oil ratio was 11,861 cu. ft. Gas volume was around 2,958,000 cu. ft. daily.

Humble Oil & Refining Co. 1 E. N. Rylie, southeast of Kemp in Kaufman County, was drilling below 6,686 ft. in lime and shale after recovering 14 ft. of core from 6,960-80 ft., being 10 ft. of black shale and 4 ft. of dense lime, with no shows.

Frazier and Bill Reiter 1 J. C. Steubenraugh, Limestone County Smackover wildcat 3 miles northwest of Mexia, was drilling lime below 5,838 ft.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Navarro County: W. M. Coats 1 B. L. Davis, John Taylor Sur., 7 mi. S Corsicana, dry, TD 2,564 ft., Austin chalk 1,400-1,900 ft., Woodbine 2,190 ft.

Red River County: J. G. Strahan 1 L. L. Bauske, J. C. Brown Sur., 10 mi. N Clarksville, dry, TD 1,986 ft. in sand.

Wood County: B. F. Phillips, Jr., 1 J. J. Jarvis, A. D. Foster Sur., 8 mi. NW Quitman, dry, TD 4,850 ft., sub-Clarksville 4,085 ft., elev. 413 ft.

N. CENTRAL TEXAS

Clay County Gets Apparent Caddo Field

WICHITA FALLS.—Gulf Oil Corp. apparently had a new Caddo field in western Clay County at its 1 George W. Scaling, Block 19, H&TC Survey, inasmuch as it is separated from the Continental Scaling Caddo field (1½ miles west) by a dry hole. The well was acidized with 4,000 gal., from 5,550-5,715 ft., then swabbed for 6½ hours, at which time it kicked off and flowed into pits for 1 hour. It was turned into tanks and gaged 98 bbl. of oil, plus about the same amount of acid water and residue, in 2 hours. Size of choke used was not reported. Flowing tubing pressure was 100 psi., and shut-in casing pressure was 600 psi. It was shut in for additional storage.

In southern Clay County, 2 miles north of Shannon, L. T. Burns 1 Dale Estate, Block 2683, TE&L Survey, topped the Caddo at 5,185 ft., drilled to 5,236 ft., and stopped to make a drill-stem test.

Russell Maguire staked location for his 1-B T. H. Cherryhomes, 467 ft. from west and 2,730 ft. from south lines of the T. Burbridge Survey, some 11 miles southeast of Jacksboro in Jack County. The proposed test is an east offset to the same operator's 1 Cherryhomes, prospective Bend conglomerate discovery, estimated good for 100 bbl. of oil a day. This latter test has been shut down by cold weather.

Three miles southwest of Jacksboro, Warren Oil Corp. 1 Tilghman, Block 4, Navarro CSL Survey, was drilling below 3,957 ft. in shale.

In Young County, 10 miles southwest of Newcastle, W. O. Carr 1 Daws, Block 751, TE&L Survey, topped the Caddo at 3,851 ft., drilled to 3,857 ft., and drill-stem tested the section for 45 minutes. Recovery was 70 ft. of mud and water, with no shows. Drill samples of the section were said to have carried good oil odor.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Eastland County: Cawthoffman, Jayred and Dockery 1 W. E. Kurklin, Sec. 62, Blk. 4, H&TC Sur., 7 mi. SW Eastland, pumped 2 bbl. oil a day, Caddo 3,386-96 ft., TD 3,720 ft.

Throckmorton County: James H. Snowden 1 Eleanor Gentry, Sec. 2342, TE&L Sur., 6 mi. SE Throckmorton, flowed 208 bbl. 41°-grav. oil in 6 hr., ½-in. choke, Mississippi 4,616-26 ft., TD, CP 220 psi., TP 180 psi., GOR 560 cu. ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Brown County: G. C. English 1 W. M. Cason, Sec. 6, ETRR Sur., 6 mi. NW Brownwood, dry, TD 2,460 ft., Caddo 1,560 ft., Ranger 2,045 ft.

United North & South Development Co. 1 Henson, Blk. 43, League 42, Comanche CSL, 3 mi. N Blankett, dry, TD 3,025 ft., Marble Falls 2,433 ft., Ellenburger 2,950 ft.

Callahan County: Arcadia Refining Co. 1 Estella Barr, Blk. 41, Comal CSL, 5 mi. SW Cross Plains, dry, TD 385 ft.

Earl W. Jones 1 F. W. Stacy, Blk. 50, League 181, Comal CSL, 5 mi. SW Cross Plains, dry, TD 405 ft.

A. R. McElreath, Jr., 1 J. H. Hughes, Sec. 10, Blk. 5, SPRR Sur., 2½ mi. SE Admiral, dry, TD 905 ft.

Clay County: Fain & McGaha 1 Van Landingham, W. W. Yearly Sur., 3 mi. SW Deer Creek, dry, TD 5,005 ft.

Coleman County: Arcadia Refining Co. 1 W. L. Edmondson, D. J. Holt Sur., ½ mi. SW Burkett, dry, TD 2,510 ft., Caddo 2,394 ft.

Comanche County: Collins & Blevins 1 Roy Parker, Sec. 57, Blk. 2, H&TC Sur., 5½ mi. NW DeLeon, dry, TD 3,020 ft.

Cooke County: Harvey Drilling Co. 1 A. R. Siddell, H. Walker Sur., 6 mi. SE Gainesville, dry, TD 3,510 ft.

Eastland County: Joe Hunter 1 G. T. Blackwell, Sec. 1, D&DA Sur., 4 mi. W Gorman, dry, TD 3,285 ft., swabbed 25-30 bbl. oil a day, decreased to 10 bbl., Ellenburger 3,264-78 ft.

Roger H. King 1 J. H. Bransford "A," Sec. 7, Blk. 3, H&TC Sur., 7 mi. SW Eastland, dry, TD 3,303 ft., flowed 2 bbl. oil a day and died, after shut in 3 weeks.

Montague County: W. J. and J. J. Moran 1 Freeman Heirs, Blk. 19, J. H. Belcher Subd., 2 mi. E Belcherville, dry, TD 5,750 ft., Caddo 5,348 ft., conglomerate with oil show 5,402 ft.

Shackelford County: Lackey & Suntex 1 M. E. Gurney, Sec. 49, BAL Sur., 5 mi. NE Sedwick, dry, TD 3,697 ft., Caddo 3,599 ft.

Stephens County: Price Crawley and Nick Crawford 1 D. S. Mitchell, Sec. 64, Blk. 4, T&P Sur., 12 mi. W Strawn, dry, TD 1,774 ft.

Stonewall County: Texas & Pacific Coal & Oil Co. 1 A. F. Winter, Sec. 179, Blk. D, H&TC Sur., 7 mi. NE Swenson, dry, TD 6,607 ft., Dotham 2,965 ft., Flippen 3,333 ft., Cisco 3,370 ft., King 3,828 ft., Palo Pinto 5,030 ft., Caddo 6,183 ft., Mississippi 6,522 ft., Ellenburger 6,565 ft., elev. 1,827 ft.

Throckmorton County: Bridwell Oil Co. 1 L. S. Moore, Sec. 649, TE&L Sur., 10 mi. SW Woodson, dry, TD 540 ft.

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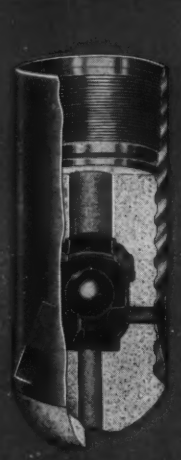

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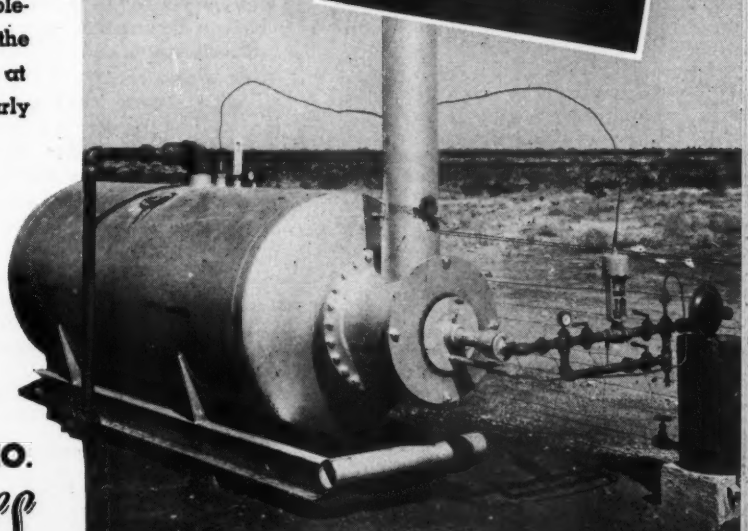

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ROCKY MOUNTAIN

Bitter Weather Hampers Drilling Operations

DENVER.—One of the most severe winters experienced in the Rocky Mountains has hampered drilling operations throughout the entire region. Below-zero temperatures have continued for weeks in parts of Wyoming and Colorado and heavy snowfall has stopped transportation in many areas. In Mush Creek, Fiddler Creek, and Lodgepole areas of Weston County, Wyoming, where four successive blizzards have occurred in 3 weeks, all drilling operations have been shut down. Schlaikjer Brothers 1 Government, C SW SW 10-44n-66w, at Lodgepole, has been abandoned after failing to find saturation in the Dakota. The well went to 6,730 ft., total depth, and topped Dakota at 6,653 ft. Saturation was logged in this sand in the Bay Petroleum Corp. well drilled last year, but the zone has not been proved commercial. E. K. Carey et al have abandoned the Kuemmerle wildcat, northeast of Lodgepole, at 5,568 ft., total depth, in the Lakota and no shows were reported for this well. It is reported Esperado Mining Co. will run casing at the Northwest Lodgepole wildcat in C SE SW 16-45n-67w, which found staining in the Newcastle, but roads to the well have been closed for 2 weeks.

Stanolind Oil & Gas Co. has plugged back and is making tests of slight shows encountered in the Frontier sands at the important Spread Creek, Teton County, Wyoming, wildcat. The well is 1 Unit, NE SE SW 25-44n-113w, and was drilled to 7,581 ft., total depth. At approximately 6,400 ft. the well crossed a fault and went from Sundance sands back into Mowry shale, first encountered at 3,800 ft. At total depth the well was reported in almost perpendicular dips. This well is located on a large surface structure in the Jackson Hole area of Wyoming, where there has been no exploratory drilling prior to this year. The well was of importance in future activities in this part of the state and its failure will probably delay further drilling in the area for several years. Further geological and possibly geophysical work may be necessary prior to further drilling in the area. Sinclair Wyoming Oil Co., Carter Oil Co., and others hold extensive lease blocks throughout the Jackson Hole area and inasmuch as the Spread Creek structure has been considered the largest and most likely to produce it is probable there will be no further drilling until another well is drilled on this structure.

Shell Oil Co., Inc., failed to get a test of the stained zone in the interesting Clear Creek wildcat in C NW SE 11-57n-78w, Sheridan County, Wyoming, and is now coring ahead in dolomites and limes, probably in the base of the Minnelusa. The tests were attempted at 10,532 ft., total depth, with Minnelusa topped at approximately 10,170 ft. Cores below 10,500 ft. showed light, streaked saturation. This is the only show of importance reported for this well, which is projected as a Madison test. Hunt Oil Co. is a partner in the well and both operators have extensive lease blocks through the area. This is the first deep wildcat in this part of the Powder River basin, and location for the test was made following geophysical work throughout the area. Shell is now below 9,800 ft. at the Ash Creek wildcat, Big Horn County, Wyoming, some 35 miles northwest of the Clear Creek well.

Amerada Petroleum Corp. has spudded the important wildcat at 1 Unit, C SE SE 10-44n-79w, Johnson County, Wyoming, in the Smiths Cut area. Union Oil Co. of California and Newmont Oil Co. are partners in the well, which is scheduled to go to 12,500 ft. for a test of the Frontier sands. This wildcat is located on the west side of the Powder River basin, north of Continental Oil Co. Sussex field, which was a discovery in the Lakota sand a year ago.

New locations.—There were eight new locations, with four of the wells in Montana, three in Wyoming, and one in Utah. In Utah Amerada made an offset location to its recent Green River Unit dry hole which was drilled to 5,645 ft. and abandoned with junked hole. The new well is 2 Unit, NE SW NW 2-22s-16e, Grand County, one location southwest of the first well. Shows of gas and distillate were reported for the first well, but data on tests and formations has not been released by the operator. Morris Oil Co. has made location for a wildcat at 1 Scott, NW SW NW 12-26n-2w, in the Conrad-Midway area, Pondera County, Montana.

Completions.—There were 19 wells completed, with 11 in Wyoming, 7 in Montana, and 1 in Colorado. Daily initial for the wells was 2,554 bbl. of oil. Continental's third well at the Sussex Unit, Johnson County, Wyoming, was completed for a gage of 300 bbl. daily of 40°-gravity oil through ¼-in. choke, and the well is estimated to have an open-flow potential in excess of 1,000 bbl. of oil daily. At Tow Creek field, Colorado, The Texas Co. abandoned a granite deep test. Hunt Oil Co. and Gulf Oil Corp. abandoned a deep test in the Hinsdale area, Valley County, Montana. This well is located on the southeast flank of the large Bowdoin structure, where Texas has drilled two deep dry holes in recent years.

WYOMING WILDCAT FAILURE

Spring Valley, Uinta County: New Park Mining 15-1 UPRR, NE NE SE 15-13n-119w, 995 ft. TD, suspended indefinitly.

COLORADO WILDCAT FAILURE

Tow Creek, Routt County: Texas 1 Colvert, NE NW SE 7-6n-86w, 5,627 ft., TD, abnd., Frontier 3,475 ft., Dakota 3,907 ft., Morrison 4,045 ft., Sundance 4,357 ft., Red beds 4,575 ft.

MONTANA WILDCAT FAILURE

Hinsdale area, Valley County: Hunt & Gulf 1 J. J. Loberg, C SW SE 26-30n-36e, 6,130 ft. TD, abnd., Eagle 940 ft., Colo-

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TEXAS GULF COAST

Gas Condensate Production Extended in Sheridan Field

HOUSTON. — Gas - condensate production at Sheridan field in Colorado County has been extended eastward by Shell Oil Co., Inc., 2 Hill Bank & Trust Co., located in J. Cheetham Survey. Drilled to a total depth of 10,449 ft., with top of sand at 9,384 ft., this well was completed flowing an initial production of 202 bbl. oil per day through $\frac{5}{8}$-in. choke, and 3,581,000 cu. ft. of gas through a $\frac{1}{2}$-in. choke, gas-condensate ratio 17,710. Tubing pressure 1,986 psi., shut-in pressure 2,719 psi., gravity 60°. Production is through perforations at 9,384-9,404 ft.

Humble Oil & Refining Co. 2 William M. Rice Institute has indicated new oil production in the southern portion of Tyler County. On a test in a shallow sand from 7,386-94 ft., the well came in flowing at the rate of 107 bbl. of fluid daily, showing 64.2 bbl. of oil, through a $\frac{3}{8}$-in. choke. Gas-oil ratio was 933, with flowing pressure on the tubing at 100 psi. Testing continues from this level. Total depth is 9,538 ft., with 5½-in. casing cemented to 9,036 ft.

Magnolia Petroleum Co. 1 Felix Sowa, a wildcat test in the southern portion of Austin County, developed good pressures on a test, with tool set at 9,550 ft., and ¼-in. chokes used with 750 ft. of water cushion, developed a good blow after 30 minutes. Tool was pulled and recovered 800 ft. of drilling mud and water cushion. Bottom-hole pressure, shut in, was 4,350 psi. Tubing and packer have been pulled and operators are preparing to make a second test. Total depth of the hole is 9,661 ft., with 7-in. casing cemented at 9,598 ft.

Rudo Oil & Gas Co. 1 McFall Kerbey et al, wildcat prospect approximately 4 miles west-northwest of Yoward field, in Bee County, on a 15-minute drill-stem test at 6,805-20 ft., through ¼-in. chokes, recovered two or three stands of condensate-cut water cushion, and cored ahead below 6,820 ft. This well previously had tested condensate from 6,660-65 ft., and 6,801-05 ft. in the Wilcox zone. Test is located in northeast corner of Thos. B. Reese Survey.

Eleven wildcat starts were included in the 39 new locations reported for Districts 2 and 3. The wildcats are located three in Victoria, two in Brazoria and DeWitt, and one each in Gonzales, Jackson, Newton, and Polk counties. Four successful exploratory tests were completed, two in Goliad and one each in Bee and Calhoun counties, while seven were dry, one each in Brazoria, Burleson, Fort Bend, Goliad, Lavaca, Live Oak, and Wharton counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Bee County: New gas-condensate pool—Sun Oil Co. 1 Ehlers-Wolters Unit, in V. M. Ehlers tr., AB&M Sur., 14 mi. NW of Beeville, and 1½ mi. SW of Yoward field, TD 7,696 ft., top sand 7,549 ft., perf. 7,548-58 ft., IP: 9,200,000 cu. ft. gas per day on open flow, on $\frac{1}{4}$-in. choke, flowed 1,555,000 cu. ft. gas per day and 35 bbl. condensate per day, TP 2,060 psi., CP 2,216 psi.

Calhoun County: New gas pool—Quintana Petroleum Corp. 1 Louise Kubatt et al, in Y. Benavides Grant, 7½ mi. W of Port Lavaca, TD 9,310 ft., top sand 8,760 ft., perf. 8,767-91 ft., IP: 29,000,000 cu. ft. gas per day on open flow, GOR 28,735, shut-in pressure 3,150 psi., grav. 55.1°.

Goliad County: New gas pool—Ginther, Warren & Ginther 1 Sallie Flowers, in Andrew Devereux Sur., 11 mi. S of Goliad, TD 5,183 ft., top sand 4,240 ft., perf. 4,240-54 ft., IP: 51,000,000 cu. ft. gas per day on open flow.

New gas-condensate pool—W. L. Goldston 1 J. R. & A. D. Willbern, in Victor Blanco Grant, 1½ mi. NW of Charco and 1 mi. SE of Karnes-Goliad county line, TD 9,277 ft., top sand 8,660 ft., perf. 8,660-72 ft., IP: 18,000,000 cu. ft. gas per day on open flow, with spray of condensate, shut-in pressure 3,425 psi.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Brazoria County: Hastings Oil Co. 1 Hastings Oil Co., HT&B Sur. A-542, 3 mi. NW of Hastings production, dry, TD 4,985 ft.

Burleson County: A. J. Maresh, Paul A. Billingsley & Henry R. Maresh 1 Frank A. Horak, in S. F. Austin Lge. 2, 9 mi. S of Caldwell, dry, TD 4,818 ft.

Fort Bend County: Warren Oil Corp. 1 T. C. Ehlert, H&TC Sec. 91, 2 mi. S of Beasley townsite, dry, TD 8,452 ft.

Goliad County: Stewart Pet. Co. 1 Swicheimer est., Guadrille Irrig. Co. Sur., 6 mi. S of Fannin, dry, TD 4,756 ft.

Lavaca County: Shell Oil Co., Inc., 1 Wm. Steinman. SA&MG Sur. 7, 1½ mi. NE of Provident City field, dry, TD 8,873 ft.

Live Oak County: Humphries & Hotchkin 1 Maggie Herring, in Thomas Henry Sur., 4 mi. NW of Three Rivers, dry, TD 1,667 ft.

Wharton County: Lloyd H. Smith 1 A. Reich, in Mark Weiss Sur., Sec. 26, dry, TD 7,170 ft.

SOUTH LOUISIANA

Big Point Test Flows At 130-Bbl. Rate

NEW ORLEANS. — Lynn Oil Co.-Temple Hargrove et al 1 State Lease 318, a semiwildcat in the Big Point discovery area, Lake Pontchartrain, St. Tammany Parish, through a $\frac{1}{8}$-in. choke, the test

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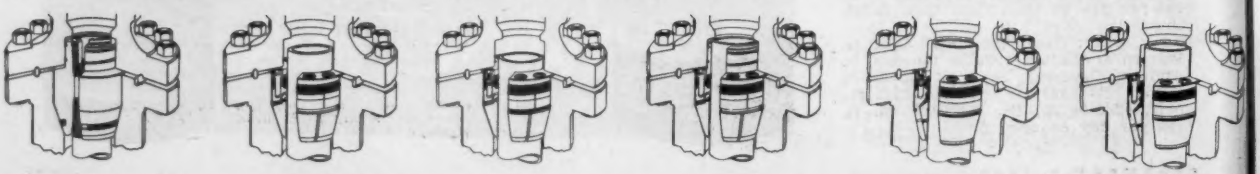


TYPE BX **TYPE KU** **TYPE KT** **TYPE KUX** **TYPE NT** **TYPE NU**

XUM

flowed at the rate of 130 bbl. of condensate along with 5,200,000 cu. ft. of gas per day. Flowing pressure on the tubing during the test was 2,700 psi. Total depth is 7,472 ft. Production is through perforations at 7,200-04 ft. Operators continue to test.

The California Co. 2 State Lease 1278, in Main Pass, Block 69 field, in the offshore waters of Plaquemines Parish, is completing as an oiler through shallow perforations at 5,768-5,804 ft. Total depth is 6,114 ft. with 7-in. casing cemented in the hole on bottom.

Salt has been topped at a shallow depth in The California Co. 1 State Lease 1367, Block 3 in the Gulf, off the shore line of Lafourche Parish. Top of salt at 2,120 ft. Operators are coring below the top at 2,131 ft.

Kerr-McGee Oil Industries, Inc., 5 State Lease 754, Block 32, in Block 32 field off the Terrebonne Parish shore line, is testing oil sand through perforations at 1,502-20 ft. Total depth is 2,319 ft. with 7-in. casing cemented at 1,575 ft.

The 24 new locations reported this week include 3 wildcat starts, 1 each in Acadia, Plaquemines, and St. Mary parishes. One successful wildcat was completed opening a new oil pool in St. Martin Parish, while three wildcats were dry, two in Beauregard and one in Jefferson Davis parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

St. Martin Parish: New oil discovery, Duck Lake—Humble Oil & Refining Co. 1 Atchafalaya Land Co., 1-15s-11e, on S side of Duck Lake and 4 mi. SW of West Lake Verrett production, TD 12,525 ft., top sand 11,642 ft., perf. 11,642-652 ft., IP: 273 bbl. oil per day through 12/64-in. choke, GOR 751, TP 1,060 psi., grav. 36.2°.

SOUTH LOUISIANA WILDCAT FAILURES

Beauregard Parish: The Atlantic Refining Co. 2 Kirby Lumber Co., 18-5s-12w, dry, TD 9,349 ft.

Cox & Hamon 1 A. Cooley, 26-4s-12w, dry, TD 9,520 ft.

Jefferson Davis Parish: Sun Oil Co. 2 Niblett Farms, 2-11s-5w, on Niblett Farms prospect, dry, TD 12,001 ft.

KANSAS

Rooks County Wildcat Has Show in Two Zones

BIRMINGHAM & BARTLETT found a good show of oil in the Arbuckle at 1 Marcotte, SE SW NW 18-10s-19w, Rooks County, following good recovery on drill-stem test of the Lansing. The well is about ¾ mile north of Berland pool where production is from the Arbuckle. The recovery from the drill-stem test of the Lansing-Kansas City was 3,383 ft. from pay at 3,493-3,528 ft. Casing was set 1 ft. in the Arbuckle at 3,766 ft. and total depth is 3,767 ft.

J. M. Huber Corp. and Pabco Drilling Co. have a prospective oil well less than 1 mile northeast of Bartholomew gas pool in Sedgwick County at 1 Berk, SW SE NE 30-27s-4w. On a 45-minute drill-stem test of the Mississippian at 3,714-50 ft., gas was at the surface in 4 minutes and oil flowed in 40 minutes. Recovery was 480 ft. of oil. Bottom-hole pressure was 1,100 psi.

Derby Oil Co. and Peel Drilling Co. have completed 1 Lewis, NE NE NW 23-10s-21w, Graham County, with a potential of 159 bbl. per day from the Arbuckle, topped at 3,777 ft. Total depth is 3,784 ft. The well opens Morlan pool. The new pool is in the extreme southeastern part of Graham County and about 5 miles south of Morel pool.

In Ellis County, Petroleum, Inc., has set casing 1 ft. in the Arbuckle at 1 Ryan, SE SE NW 6-15s-18w, after an oil recovery on drill-stem test of the Arbuckle at 3,620-28 ft. The 1-hour test recovered 15 ft. of oil and 28 ft. of mud. Bottom-hole pressure was 1,000 psi. The well also had a small show in the Lansing at 3,325-27 ft. and 3,343-45 ft. The well is about 1 mile northwest of Ruder pool.

The recently opened Sunny Valley pool in Barton County is getting an extension to the west where Hanlon & Boyle 1 Schartz, SE SE SW 7-20s-12w, flowed oil on a 15-minute drill-stem test at 3,193-3,202 ft. Recovery was 660 ft. of oil. The Lansing was topped at 3,171 ft. and total depth is 3,448 ft. in the Arbuckle. The same operators have started 2 Schartz, ¼ mile to the west.

For the week, a total of 50 new locations were announced with Butler County leading with 9 new spots followed by Barton and Russell with 8 each.

KANSAS WILDCAT FAILURES

Butler County: Bennett & Roberts Drilling Co. 1 Hall-Kanady, NE NE NW 6-28s-8e, dry, TD 3,250 ft., Mississippian 2,784 ft., Kinderhook 3,171 ft., Simpson 3,223 ft., Arbuckle 3,241 ft.

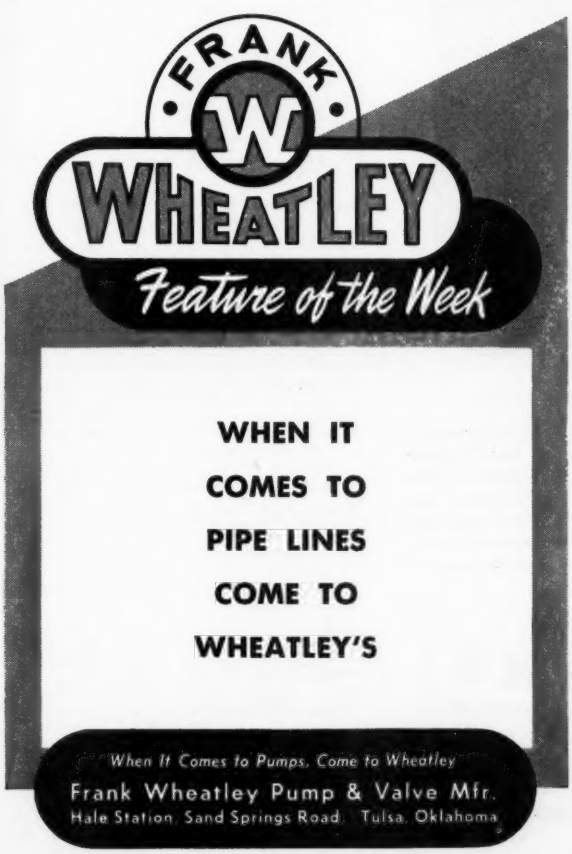
Pawnee County: Amerada Petroleum Corp. 1 F. O'Dell, SW SW NW 15-22s-17w, dry, TD 4,326 ft., anhydrite 1,020 ft., Heebner 3,533 ft., Lansing 3,636 ft., Viola 4,090 ft., Sylvan 4,150 ft., Arbuckle 4,185 ft.

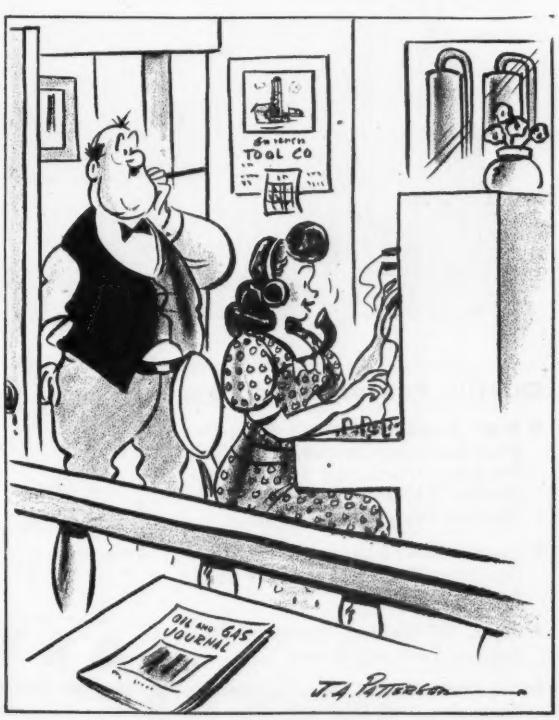
Rice County: Barnett Drilling Co. et al 1 Stout, NW NW SE 6-20s-9w, dry, TD 3,405 ft., Heebner 2,800 ft., Lansing 2,064 ft., conglomerate 3,289 ft., Simpson 3,317 ft., Arbuckle 3,375 ft.

Rooks County: Sam Pack 1 Schruben, SW SW SW 16-7s-19w, dry, TD 3,471 ft., anhydrite 1,490 ft., Heebner 3,130 ft., Lansing 3,166 ft., conglomerate 3,398 ft., Arbuckle 3,433 ft.

Heathman & Honaker Drilling Co. 1 Nutsch, NE NE NE 3-10s-20w, dry, TD 3,913 ft., Heebner 3,504 ft., Lansing 3,541 ft., conglomerate 3,832 ft.

Stafford County: Ingling et al 1 Rugan, SE SE SW 2-21s-11w, dry, TD 3,498 ft.,





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Heebner 2,946 ft., Lansing 3,079 ft., conglomerate 3,340 ft., Arbuckle 3,470 ft.

R. L. Williams 1 Pritchard, NE NE NE 22-22s-14w, dry, TD 3,843 ft., Topeka 3,120 ft., Lansing 3,456 ft., conglomerate 3,741 ft., Viola 3,759 ft., Simpson 3,784 ft., Simpson sand 3,829 ft., Arbuckle 3,827 ft.

MISSISSIPPI

Gulf Completes Successful Test in Eucutta Field

JACKSON.—Gulf Refining Co. 4 N. Davis, 11-9n-9w, in Eucutta field, Wayne County, has been completed with an initial production of 141 bbl. per day, on pump, gravity 32.4°. Total depth is 5,261 ft., and production is through perforations from 5,108 ft. to 5,261 ft.

In LaGrange field, Adams County, Cities Service Oil Co. 2 C. W. Hazlip, 78-7n-2w, was drilled to a total depth of 6,275 ft., and flowed a potential test of 91 bbl. per day through an 18/64-in. choke, tubing pressure 75 psi., gravity 43°. Production is through perforations at 6,175-84 ft.

In LaGrange field-South, Sohio-James E. Kemp A-1 Ogden-McCalip, 41-6n-2w, flowed an initial production of 190 bbl. per day through a 9/64-in. choke, tubing pressure 625 psi., gravity 43.5°. Total depth is 6,389 ft., and production is through perforations at 6,377-81 ft.

Grubb & Hawkins 1 C. L. Gray Lumber Co., 23-9n-8w, in Yellow Creek field, Wayne County, was completed for potential, on pump, of 60 bbl. of 19.4°-gravity oil per day. Total depth is 5,186 ft., with perforations from 5,100 ft. to 5,184 ft.

Fifteen new locations were reported for Mississippi, four being wildcat starts, one each in Adams, Clarke, Forrest, and Scott counties. Two wildcat failures were reported this week, one each in Sharkey and Warren counties.

MISSISSIPPI WILDCAT FAILURES

Sharkey County: Amerada Petroleum Corp. 2 Panther-Burn Plantation, SW NE 14-14n-7w, dry, TD 3,970 ft.

Warren County: C. Porter Johnson 1 Fannie Coley, 26-17n-4e, dry, TD 4,937 ft.

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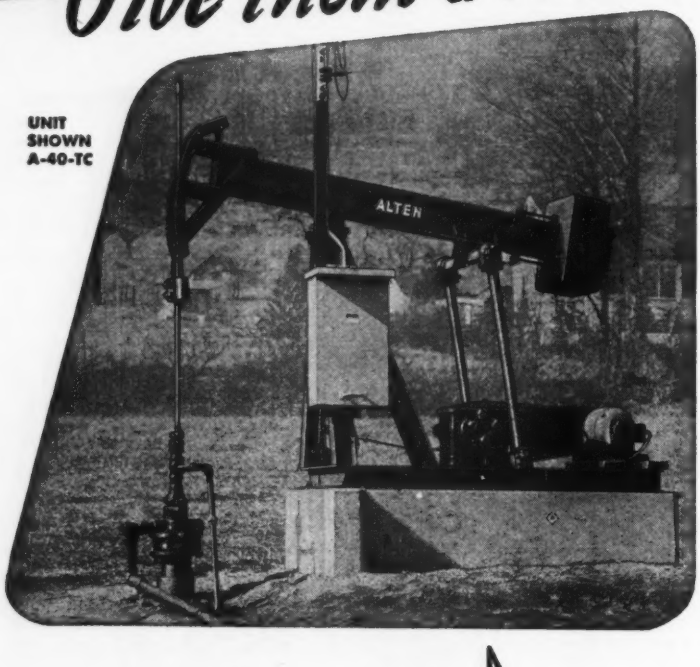

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SOUTHWEST TEXAS

New Gas Condensate Discovery for Starr

CORPUS CHRISTI.—A new gas-condensate discovery in northeastern Starr County, Baldridge & King 2 Dario Guerra, in GC&SF Survey 877, has been completed for a dual-sand gas-condensate well through perforations at 8,010-24 ft. and 7,750-62 ft. Potential gage has not been made as yet. Total depth is 8,646 ft., with 5½-in. casing set to 8,550 ft. This well is located 3 miles southeast of Sun field.

A new oil pay for Stratton field, Jim Wells County, has been completed at Humble Oil & Refining Co. A-13 King Ranch-Stratton, in Paso Ancho de Arriba Grant. Top of pay 6,995 ft., Arroyo sand, with total depth at 7,313 ft. On potential test the well flowed 116 bbl. of oil per day through a 5/32-in. choke, gas-oil ratio 13,000. Tubing pressure 3,450 psi., casing sealed. Gravity 29.4°. Production is through perforations at 6,995-7,007 ft.

Potential gage has been reported for Magnolia Petroleum Co. 1 Ella C. Wolfe, new discovery well in Frio County, 5½ miles northeast of Pearsall. Through open hole 3,704-24 ft., the well pumped 5 bbl. of net oil, no gas, and shut in. This well is located in W. P. Wolfe Survey 1,144.

There were 44 new locations reported for Districts 1 and 4, of which 14 are wildcat starts, 3 each in Duval and Sarr, 2 in Jim Hogg, and 1 each in Guadalupe, Kerr, Nueces, San Patricio, Williamson, and Zapata counties. Two successful exploratory tests were completed, 1 each in Caldwell and Frio counties, while 11 were dry, 2 in Edwards, and 1 each in Duval, Jim Hogg, Jim Wells, McMullen, San Patricio, Val Verde, Webb, Williamson, and Zapata counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Caldwell County: New oil pool—Wiegand Bros. 1 Pat King, Sampson Connell Sur., A-63, 2 mi. S of Lytton Springs, 1 mi. W of Walnut Creek, top sand 1,476 ft., Austin chalk, open hole 1,453-1,585 ft., TD 1,585 ft., IP: 8 bbl. oil per day on pump, GOR 200, grav. 28°, 30 per cent water.

Frio County: New oil discovery—Magnolia Pet. Co. 1 Ella C. Wolfe, in W. P. Wolfe Sur. 1144, 5½ mi. NE of Pearsall, TD 3,724 ft., top sand 3,704 ft., open hole 3,704-24 ft., IP: 5 bbl. oil per day (net oil) on pump, no gas, shut in, 80 per cent water.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Duval County: M. L. Massingill et al B-1 Hamilton, in J. Poitevent Sur. 31, 19 mi. N-NW of San Diego, dry, TD 3,705 ft.

Edwards County: N. B. Craig & J. R. Sanford 2 J. T. Evans, in G&SF RR Sur., Blk. L, 28 mi. W of Rock Springs, dry, TD 402 ft.

V. J. Meyer 3 S. N. Brown, in GWT&P RR Co., Sur. 66, 11 mi. W of Rock Springs, dry, TD 745 ft.

Jim Hogg County: DeLange, Daubert & Achning 1 Armstrong Heirs, in Sur. 224, 10 mi. SW of Hebbronville, 2 mi. NE of Armstrong field, dry, TD 3,700 ft.

Jim Wells County: La Gloria Corp. 2 Victor Garcia, in "La Anima Sola" Vital Yno-

josa Grant, 9 mi. SW of Ben Bolt, in North Bandera area, dry, TD 6,386 ft.

McMullen County: L. C. Quin & E. B. Talley 2 Nueces Land & Live Stock Co., in A&TB Sur. 22, A-609, dry, TD 867 ft.

San Patricio County: Curtis Singleton Drilling Co. 1 C. H. Phillips, in Sec. 60, 1½ mi. N-NE of East White Point field (old well drilled deeper, OTD 4,098 ft.), dry, TD 6,893 ft.

Val Verde County: B. E. Wilson 3 Wilson & Hodge, GC&SF Sur. 67, Blk. E, dry, TD 350 ft.

Webb County: O. W. Killam 1 Bruni est., Brown Subd., Albercas Grant, 13 mi. SW of Bruni, dry, TD 2,670 ft.

Williamson County: D. B. Scully 1 J. R. Naizer, Pedro Zarza Sur., dry, TD 1,408 ft.,

Zapata County: Bridwell Oil Co. and W. C. McBride, Inc., A-5 Robert Hinnant, Lot 43, Sur. 613, 15 mi. SE of Mirando Valley field, dry, TD 1,554 ft.

MICHIGAN

Drilling Spurt Starts in Van Buren's Traverse Area

MOUNT PLEASANT.—A 5 per cent water cut was showing with oil production from P. K. Degenther 1 Herman, SE SE NE 19-10n-13w, Muskegon County wildcat well which is being tested in the Traverse. Well had produced at the rate of 15 bbl. per hour first 2 days after acid treatment, when first indications of water started to appear. Exact source of the water had not been determined, but it was believed that it was probably brackish bottom-hole water.

Meanwhile interest in the new area was centered on Rex Oil & Gas Co. 3 Herman, NW SW NE 19-10n-13w, which was cased with 5-in. at 2,024 ft., above the Traverse objective. Well was reported to be about flat on key markers with the Degenther producer. Rex expected to complete this test by early next week.

A new drilling spurt in the shallow Traverse area in Van Buren County started this week following the completion of George F. Lister 1 Rogustad, NW NW SW 18-1s-15w, outpost producer to the west of Coffee Lake Traverse oil pool. New well was reported to be producing about 10 bbl. of oil an hour after acidization with 500 gal. Three locations were being prepared for immediate drilling.

Ashby Drilling Co. 1 Williams et al, NW NW NE 30-1s-12w, Kalamazoo County wildcat, was being tested in the Traverse following acidization with a total of 1,500 gal. On early pump tests, 80 bbl. of net oil and 40 bbl. of salt water were recovered.

The Michigan Department of Conservation approved 20 new drilling permits during the week ended January 21. Of this number, 12 were classified as developmental wells for Michigan oil fields and the other 8 were for wildcat tests.

MICHIGAN SUCCESSFUL WILDCAT

Van Buren County, Columbia Township: George F. Lister 1 Rogustad, NW NW SW 18-1s-15w, Traverse lime 1,128 ft., 240 bbl., TD 1,131 ft.

MICHIGAN WILDCAT FAILURES

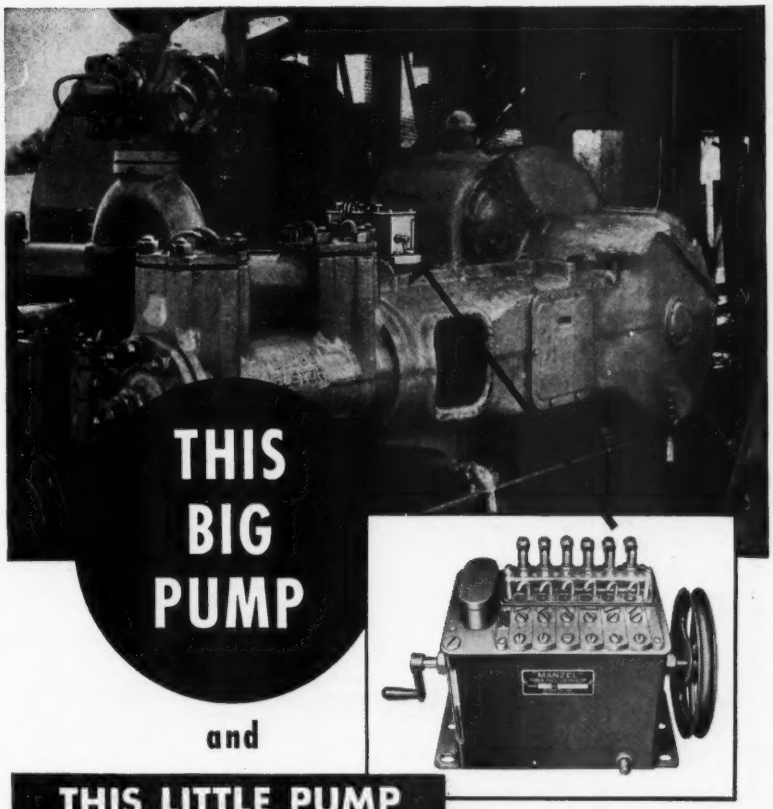
Allegan County, Watson Township: Gordon Oil Co. 1 Clawson, SW SE SW 17-2n-12w, dry in Traverse, TD 1,552 ft.

Clyde Township: Ohio Oil Co. C. T. A-22 U. S. of America, NE NE NW 27-2n-15w, dry in Traverse, TD 1,281 ft.

Salem Township: Louis Zellman 1 Mellish, NE SE SW 25-4n-13w, dry in Traverse, TD 1,679 ft.

Berrien County, Hagar Township: Harris Oil Co. 1 Lester Harris, NE NE NE 13-3s-18w, dry in Traverse, TD 892 ft.

Gratiot County, Lafayette Township: Richard Steinhorst 1 Richardson, NW SE



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SW 14-11n-1w, dry in Dundee, TD 3,250 ft.

Saginaw County, Jonesfield Township: Fred Riddell 1 Jonesfield Township, NE NE NW 16-12n-1e, dry in Dundee, TD 3,418 ft.

LA.-ARK.

Gas-Cut Mud Recovered In DeSoto Parish Test

SHREVEPORT.—Potter Oils, Inc., 2 T. T. Tolson, 1-13n-16w, DeSoto Parish, recovered 90 ft. of gas-cut mud on a 1-hour test of the Rodessa through perforations at 5,422-28 ft. New shots were placed at 5,342-54, 5,360-78, and 5,400-28 ft., and after 10,000-gal. acid treatment, the well flowed an estimated 1,000,000 cu. ft. of gas daily, plus acid water having a slight show of oil. Location is 10 miles north of the Logansport gas field.

Southeast of the Lisbon field, Lincoln Parish, Southwest Gas Producing Co. 1 W. I. Burgess, 8-20n-4w, had total depth at 9,158 ft. in the Cotton Valley and was running casing. Cores from 8,590-8,647 ft. recovered hard, tight sand and shale with slight distillate odor. Slightly porous sand with gas-distillate odor and taste was recovered from 8,695-8,713 ft., and a 9-ft. section from 9,127-36 ft. was hard, tight shaly sand having pinpoints of fluorescence.

Roy Fisher 1 Duggan, 25-20n-5w, Lincoln Parish, was drilling below 5,582 ft. in the lower Glen Rose. Cores at 5,564-82 ft. recovered shale and hard, tight lime with no shows.

In Madison Parish, Continental Oil Co. 4 Singer Manufacturing Co., 2-15n-11e, was drilling below 3,040 ft. in the Wilcox. It is a new 7,800-ft. wildcat, located on seismograph and subsurface prospect.

The California Co. 1 Brown Paper Mill, 10-16n-3e, Ouachita Parish, was fishing bit cones at 8,502 ft. in the Travis Peak. Sohio Petroleum Co. 1 Raworth, 26-12n-10e, Tensas Parish, was in the Tuscaloosa at 7,970 ft. Continental 1 Mansfield Hardwood Lumber Co., 34-13n-4w, Winn Parish, was below 6,450 ft. in the lower Cretaceous, topped at 4,882 ft.

Hunt Oil Co. 1 John R. Smith, 10-23n-7w, Claiborne Parish, was drilling at 8,370 ft. in the Travis Peak. Chicago Corp. 1 Allen, 15-22n-15w, Caddo Parish, cored shale and sandy shale with streaks of sand having fair oil shows at 2,462-2,554 ft. Phillips Petroleum Co. 1 Ellerbe, 17-15n-12w, was coring below 8,080 ft. Core information was to be released on further reports. Sohio 1-B LaSalle Land Co., 33-14n-5e, Caldwell Parish, was below 5,705 ft. in the lower Cretaceous and preparing to run electrical surveys.

In Ouachita County, Arkansas, Carter Oil Co. 1 Landers, 28-14s-18w, was drilling at 3,970 ft. A drill-stem test at 2,156-62 ft., open 1 hour, recovered 35 ft. of mud with no shows. Cores at 2,202-07 ft. recovered 2½ ft. of sand with slight oil shows.

NORTH LOUISIANA WILDCAT FAILURES

Jackson Parish: Hunt Oil Co. 1 W. A. J. Peevy, NW NE 32-15n-3w, dry, TD 10,013 ft., no tops reported.

Union Parish: C. M. Bagley 1 E. W. Haynie, SW SE SE 21-23n-1w, dry, TD 2,264 ft., Wilcox 1,105 ft., Nacatoch 2,012 ft., elev. 166 ft.

ARKANSAS SUCCESSFUL WILDCAT

Columbia County: Lion Oil Co. 1 Story, NE SE 20-18s-19w, discovery of Pine Tree field, flowed 555 bbl. 44°-grav. oil a day, 12/64-in. choke, Smackover perforations 8,426-33 ft., TP 950 psi., GOR 1,000 cu. ft., top Smackover 8,372 ft., porosity 8,412-47 ft., elev. 269 ft.

ARKANSAS WILDCAT FAILURES

Lafayette County: McAlester Fuel Co. 1-A C. F. Tatum, NE SE 33-15s-23w, dry, TD 7,430 ft., Nacatoch 1,382 ft., Tokio 2,438 ft., Massive anhydrite 3,454-3,596 ft., James 4,044 ft., Travis Peak 4,374 ft., Buckner 7,050 ft., Smackover 7,327 ft., porosity 7,332 ft., elev. 322 ft.

G. H. Vaughn 1 J. J. Hensan, NW NW 22-16s-23w, dry, TD 5,007 ft., Nacatoch 1,473 ft., Paluxy 2,860 ft., Massive anhydrite 3,690-3,848 ft., James 4,378 ft., Pettit 4,633 ft., Travis Peak 4,756 ft., elev. 328 ft.

Madison County: J. V. McCallister 1 C. L. Howard, SE NW SW 25, 15n-27w, dry, TD 914 ft.

Nevada County: Carter Oil Co. 1 J. S. Blakely, 10-12s-21w, dry, TD 2,928 ft.

N. A. Hardin 1 L. L. Mitchell, 35-13s-23w, dry, TD 5,200 ft., base Massive anhydrite 2,400 ft., Buckner 4,795 ft., Smackover 4,988 ft., elev. 351 ft.

Union County: Guy Mabee Drilling Co. 1 Union Saw Mill, NE NE SE 24-17s-13w, dry, TD 2,512 ft., Nacatoch 2,400 ft., Saratoga 2,460 ft.

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APPALACHIAN FIELD

Gasser Completed in Oriskany Sand

PITTSBURGH.—In Davis district, Tucker County, West Virginia, Cumberland & Allegheny Gas Co. 1-A-418 West Virginia Power & Transmission Co., elevation 3,296 ft., was completed with gas gaging 537,000 cu. ft. in the Oriskany sand, total depth 8,192 ft. In Malden district, Kanawha County, United Fuel Gas Co. 5857 A. H. Boyd, elevation 1,060 ft., is being plugged and abandoned after reaching a depth of 6,694 ft. in the Clinton sand; in Big Creek district, McDowell County, this company's 1-6219 New River & Pocahontas Coal Co., elevation 1,627 ft., was reported dry; total depth 7,276 ft.

New locations in West Virginia were 21: Union district, Barbour County; Elk district, Kanawha County; Harts Creek and Washington districts; Lincoln County; Webster district, Marshall County; Teays Valley district, Putnam County; Clear Fork district, Raleigh County; Warren district, Upshur County; Stonewall and Union districts, Wayne County; and in Baileysville, Center, and Oceana districts, Wyoming County.

In Cherry Township, Butler County, Pennsylvania, Hill Oil & Gas Co. 1 Joseph Duffy, elevation 1,203 ft., topped the Onondaga lime at 4,698 ft., the Oriskany sand at 4,829 ft., and is drilling at 4,862 ft. In Elder Township, Cambria County, Peoples Natural Gas Co. 2831 Clearfield & Bituminous Coal Co., elevation 2,010 ft., is drilling at a depth of 3,205 ft. with a show of gas testing 26,000 cu. ft.; in Shade Township, Somerset County, this company's 3725 R. F. Grove, elevation 2,343 ft., is drilling at 9,335 ft. and had a very light show of gas at 9,323-24 ft., but not enough to test. The salt water encountered at 9,225 ft. exhausted itself.

New locations in Pennsylvania were two: iin Mahoning Township, Armstrong County, and Conemaugh Township, Indiana County.

WEST VIRGINIA SUCCESSFUL WILDCAT

Tucker County: In Davis district, Cumberland & Allegheny Gas Co. 1-A-418 West Virginia Power & Transmission Co., elev. 3,296 ft., 537,000 cu. ft. of gas. Corniferous lime 7,931 ft., chert 7,959 ft., Oriskany sand 8,056 ft., gas 8,132-34 ft. and 8,148 ft. TD 8,192 ft.

WEST VIRGINIA WILDCAT FAILURES

Kanawha County: In Malden district, United Fuel Gas Co. 5857 A. H. Boyd, elev.

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1,060 ft., dry, Oriskany sand 5,182-5,208 ft., Newburg sand 5,929-50 ft., Clinton sand 6,685 ft. TD 6,691 ft.

McDowell County: In Big Creek district, United Fuel Gas Co. 1-6219 New River & Pocahontas Coal Co., elev. 1,627 ft., dry, Oriskany sand 6,468-6,517 ft., TD 7,276 ft.

CALIFORNIA

Follow-Up Well Appears Superior to Discovery

LOS ANGELES.—Hancock Oil Co. 83-23 Kern County Land, 22-30s-26e, a follow-up well to an oil discovery completed in the Gosford area of Kern County about 6 weeks ago, is running casing preparatory to completion. Indications are that this well will prove superior to the discovery and thus confirm the operator's belief that an excellent reservoir has been found in the area. While little information has been released concerning the well it has been reported that the oil sand has been found 85 ft. higher structurally than in the discovery, and that the sand body is considerably thicker than in the discovery. Total depth of the present undertaking is 8,233 ft. and casing probably will be set near the 8,000-ft. mark.

Hancock's first well in the area, the 85-23 Kern County Land, 23-30s-26e, is located about ¼ mile south of the current venture and originally came in flowing from the Stevens sand at 7,814-8,050 ft. Flow soon went to water, however, and considerable trouble was experienced in getting the well back on production. Oil flow was finally restored at a rate of 500 bbl. daily from a shallower interval at 7,835-54 ft., and then cut back to a steady rate of 261 bbl. daily through an 11/64-in. choke. So far there have been no indications of water trouble in the 83-23 Kern County Land, and a successful completion will probably touch off a rapid development campaign in the area.

Superior Oil Co. of California rapidly is approaching a new state depth record with its wildcat in the north Montalvo area of Ventura County, the 1 Limoneira, 9-2n-22w. At the latest reports the well had passed the 17,060-ft. mark and was going deeper. Currently the state depth record is held by Standard Oil Co. of California 1 Maxwell, located in the west Montalvo area of Ventura County, which went to a total depth of 17,696 ft. before stuck drill pipe forced abandonment, approximately a year ago.

Standard apparently is meeting with little success at its deep Eocene test in Greeley field of Kern County, the 12-21 Kern County Land, 7-29s-26e, after going to a total depth of 3,578 ft. in the basement. Standard ran a test at the interval 13,346-10 ft. The test, with tool open 2 hours and 15 minutes, resulted in the recovery of only mud and salt water. Standard's future plans for the well have not been announced, but is probable that tests will be made higher up in the Eocene where oil shows were reportedly encountered on the way down. If these prove unsuccessful the well probably will be plugged back for completion in one of the field's known producing horizons.

CALIFORNIA WILDCAT FAILURES

Kern County, Ant Hill area: Independent Exploration Co. 32 Cohn, 28-29s-29e, dry, elev. 678 ft., Pyramid Hills, 4,490 ft., Vedder equivalent 4,605 ft., TD 4,718 ft.

Blackwell's Corner area: Independent Exploration 1 Ryan, 36-26s-18e, dry, elev. 839 ft., TD 3,518 ft.

Mt. Poso area: Providential Development Co. 1 Providential-Hooper, 36-26s-27e, dry, elev. 951 ft., Vedder 2,678 ft., TD 2,714 ft.

Terry Drilling Co. 15-1 KCL 15-26s-28e, dry in schist, TD 1,160 ft.

Tejon area: Drilling & Production Co.

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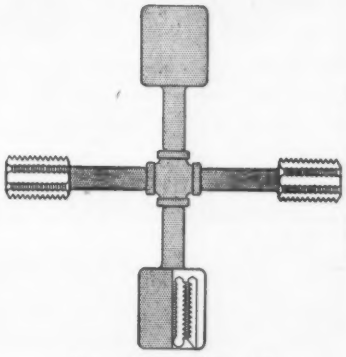

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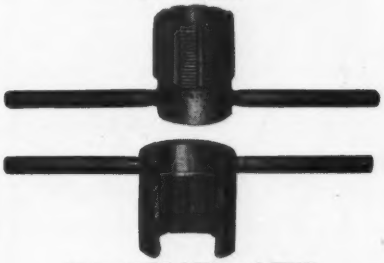

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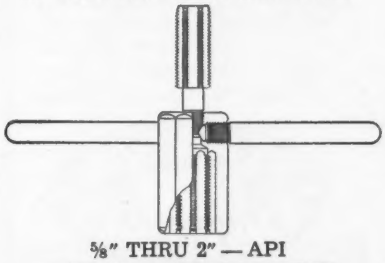

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33-32 Tejon, 32-11n-18w, dry, elev. 864 ft., TD 1,693 ft.

Jergins Oil Co. 1 Tejon, 10-11n-18w, dry, elev. 969 ft., granite, 1,253 ft., TD 1,255 ft.

Monterey County, San Ardo area: The Texas Co. 5 Rosenberg, 12-22s-9e, dry, elev. 646 ft., TD 1,492 ft.

Orange County, Anaheim area: British-American Oil Producing Co. 1 Bank of America, 14-4s-10w, dry, elev. 159 ft., TD 4,488 ft.

San Luis Obispo County, Carrizo Plains area: Union Oil Co. 2 Wreden, 16-29s-17e, dry, elev. 1,450 ft., TD 2,611 ft.

OKLAHOMA

Elk City Area Well Proves Fourth Pay Zone

ANOTHER Beckham County well has proved a fourth pay zone as Shell Oil Co. found gas and distillate in a deep zone at 1 Kelly, C NE SW 23-10n-21w. A 90-minute drill-stem test taken at 10,100-190 ft. with a 3,100-ft. water cushion got water to the surface in 22 minutes, gas in 35 minutes, and distillate in 42 minutes. The well flowed 57°-gravity distillate at the rate of 1,290 bbl. per day through ⅜-in. bottom choke and ½-in. top choke. The datum, calculated from sea level, places the test at —8,187 to 8,277 ft., lower than the deeper pays in the other wells in the area. From drill-stem tests made at the Kelly well, it has two possible oil pays; the upper at —7,549-7,637 ft. and another at —7,692-7,770 ft. The gas distillate pays tested were at —7,878-7,968 ft. and the recently tested zone mentioned above.

The Texas Co. has started a new test ½ mile south of the recent pool opener in Payne County. The well, 1 State School Land "L," NE NE NE 36-19n-3e, is a long step out from the discovery well where final completion is being held up by the weather.

H. H. Wegener has found 54 ft. of oil sand in a southwest extension of Ceres pool in Noble County. The well, 1 McClimans, SE SE NE 8-22n-1w, was drilled to 4,680 ft. and has casing set to 4,610 ft. If productive, this well will add another location to the pool that is more than 4 miles long and no more than two locations wide at any place.

Gulf Oil Corp. has completed another well on the east flank of the Velma field at 1 Thomasson, NE NW SE 31-1s-4w, Stephens County, with initial production of 581 bbl. per day. Total depth is 5,894 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Extension to Southwest Panther Creek—Phillips 1 Hart, SE NE SW 27-3n-3w, flowed 196 bbl. of 43.4°-gravity oil per day from sand at 7,815-82 ft., TD 8,010 ft.

Noble County: New pay in Northwest Perry—Carter 2 Short, SE SW NW 17 21n-1w, flowed 50 bbl. of 43.6°-gravity oil per day from Misener at 5,109-21 ft.; Pawhuska 1,983 ft., Avant 3,353 ft., lower Layton 3,817 ft., Checkerboard 3,947 ft., Big lime 4,290 ft., Oswego 4,400 ft., Cherokee 4,624 ft., Red Fork 4,822 ft., Mississippi lime 4,885 ft., Woodford 5,053 ft., Viola 5,127 ft., Wilcox 5,203 ft., Marsh 5,220 ft., Marsh sand 5,225 ft., second Wilcox 5,283 ft., TD 5,335 ft.

New pay in Southeast Polo—Phillips 2 Dayton, NE SE SW 2-21n-2w, flowed 126 bbl. of oil per day through 14/64-in. tubing choke from Misener at 4,994-99 ft., TD 5,136 ft.

Okfuskee County: New pay in Southeast Pettiquah — Warburton 1 Washington, NW SW NE 21-13n-7e, gaged 4,881,000 cu. ft. of gas from Red Fork at 3,171-86 ft.; Prue 2,775 ft., Earlsboro 3,175 ft., TD 3,203 ft.

Osage County: Oliphant 1 Osage, SE SW SW 7-25n-6e, flowed 67 bbl. of 41.5°-gravity oil per day from Mississippi chat at 2,970-74 ft., TD.

OKLAHOMA WILDCAT FAILURES

Carter County: Texas Pacific 1 Smith, SE NW NE 30-5s-1e, dry, TD 3,938 ft.

Cotton County: Moore 1 Wilson, W/2 NW SE 7-4s-11w, dry, TD 2,036 ft., conglomerate 1,412 ft., Breckenridge lime 1,704 ft., fusilinid lime 1,726 ft., lower Thomas sand 2,010 ft.

Garvin County: Elm 1 Newbern, SE NW SE 32-4n-2e, dry, TD 3,505 ft., Belle City 2,740 ft., Hogshooter 2,915 ft., McKinley sand 3,004 ft., Burns sand 3,040 ft., basal Pennsylvanian and Trenton Viola 3,240 ft., bromide dense 3,254 ft., sandy dolomite 3,360 ft.

Hughes County: Davidor 1 Meadows, SE NE NE 33-9n-9e, dry, TD 3,407 ft., Senora sand 1,320 ft., Thurman 1,522 ft., upper Bartlesville 1,871 ft., lower Bartlesville 1,968 ft., Earlsboro 2,195 ft., Booch 2,680 ft., Gilcrease sand 3,000-20 ft., 3,030-50 ft., 3,060-70 ft., and 3,120-20 ft., Union Valley 3,331 ft., Cromwell 3,370 ft.

Lincoln County: Bennett 1 Harper-Brown, SW SE SW 17-14n-6e, dry, TD 3,286 ft., no tops reported.

McClain County: Magnolia 1 Foster, C NE NE 35-7n-3w, dry, TD 9,090 ft., Woodford 8,184 ft., Hunton 8,192 ft., Chimney Hill-Hunton 8,390 ft., Sylvan 8,459 ft., Viola 8,580 ft., bromide sand 9,028 ft.

Noble County: Summit 1 Swartz, NW NW SW 8-20n-1e, dry, TD 5,296 ft., lower Pawhuska 1,941 ft., Elgin 2,022 ft., Tonkawa 2,670 ft., lower Tonkawa 2,877 ft., Avant 3,041 ft., Dewey 3,180 ft., Perry 3,222 ft., upper Layton 3,590 ft., lower Layton 3,818 ft., Checkerboard 4,008 ft., conglomerate 4,085 ft., Big lime 4,229 ft., Cherokee 4,415 ft., Verdigris 4,483 ft., Skinner 4,560 ft., Mississippi lime 4,777 ft., Woodford 5,042 ft., Misener 5,081 ft., Sylvan 5,086 ft., Viola 5,134 ft., dense 5,171 ft., dolomite 5,185 ft., Wilcox 5,228 ft., second Wilcox 5,273 ft.

Oklahoma County: Bonney 1 Bonney, NW NW SE 24-13n-1e, dry, TD 5,755 ft., Hogshooter 3,891 ft., Checkerboard 4,215 ft., conglomerate 4,484 ft., Oswego 4,820 ft.,

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Seminole County: Josaline 1 Gragg, NE NE NE 23-11n-7e, dry, TD 3,726 ft., Checkerboard 1,432 ft., Oswego 2,239 ft., Calvin 2,307 ft., Verdigris lime 2,696 ft., Inola 3,225 ft., Booch 3,509 ft., Gilcrease 3,622 ft., Cromwell 3,700 ft.

PERMIAN BASIN

Bronte Gives Promise of Becoming Important Area

MIDLAND.—Bronte (Palo Pinto) field of eastern Coke County is bearing out the optimistic predictions of some geologists, and with the completion of its fifth producer, has prospects of becoming an important producing area, and possibly an extension of the so-called Breckenridge trend.

The latest completion for the field, and the largest so far, was Hickok & Reynolds, Inc., and Dan Auld 1 O. R. McQueen, SW SE Section 450, Block 1-A, H&TC Survey, which gaged 208.3 bbl. of 47°-gravity oil in 4 hours, without acid, through 32/64-in. choke on 2-in. tubing run to 4,405 ft. Perforations were from 4,376-94 ft. Flowing pressures were 529 psi. on casing and 240 psi. on tubing. The well indicated 48 ft. of pay zone, as top of pay was reported at 4,346 ft.

In Midland County, Magnolia Petroleum Co. prepared to drill an 8,500-ft. wildcat 2¾ miles southeast of Tex Harvey Oil Co. 1 Floyd, Permian discovery now ready for completion. The new well is to be the 1 Mary E. Turner, 1,980 ft. from south and 660 ft. from east lines of Section 46, Block 37, Leonard Leech Survey. It is also 3½ miles due east of Humble Oil & Refining Co. 1 Turner, recent Clear Fork discovery around 8,500 ft.

Southwest of Midland, The Texas Co. 1 Scharbauer ran a drill-stem test on the Ellenburger at 13,140-70 ft. Open 4 hours and 45 minutes, gas came to the surface in 3 hours and 45 minutes, and recovery was 100 ft. of oil plus 2,340 ft. of salt water. An attempt was made to acidize from 13,070-13,120 ft., but the formation would not break down, and new perforations were made from 13,049-13,130 ft.

Gulf Oil Corp. 1-E Bryant, 14 miles south of Midland, was reported showing more water and less oil. Earlier tests of the Silurian had good prospects of production. This week, however, new perforations in that zone from 12,660-12,700 ft., acidized with 1,000 gal., resulted in the well kicking off to flow the oil load and most of the acid residue. The flow then died. It was then swabbed twice an hour and recovered 3 bbl. of oil and 56 bbl. of salt water in 19 hours.

Magnolia 2-11 University, wildcat test between Shafter Lake and Fullerton fields of Andrews County, ran a 3-hour drill-stem test on the Wolfcamp, lower Permian. Gas came to the surface in 2 hours and 10 minutes, and recovery was 207 ft. of gas-cut mud plus 920 ft. of heavily oil and gas-cut mud. There was no formation water. Location is in Section 11, Block 13, University Survey. It drilled ahead, and will test the Devonian.

Magnolia 1-39 Eaton, North Pecos County deep test, 9 miles west of Imperial, reported top of the Ellenburger at 9,057 ft., on an elevation of 2,454 ft. At last report it was making a drill-stem test from 9,055-87 ft. It was said to have found an unusually thick section of Simpson above the Ellenburger.

Magnolia 1-A TXL, north Upton County wildcat, plugged back to 13,195 ft. from 13,295 ft., after developing salt water on a drill-stem test at 13,256-95 ft. Packer was to be set around 13,115 ft., and run another test on an 80-ft. uncased section above the

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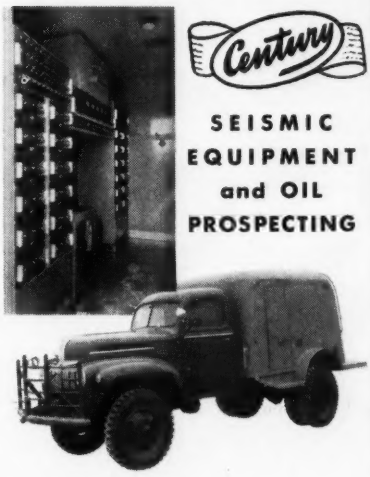

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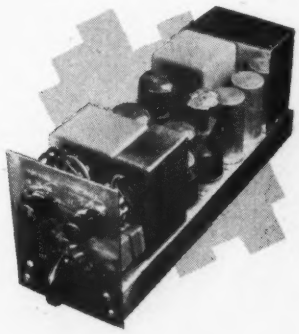

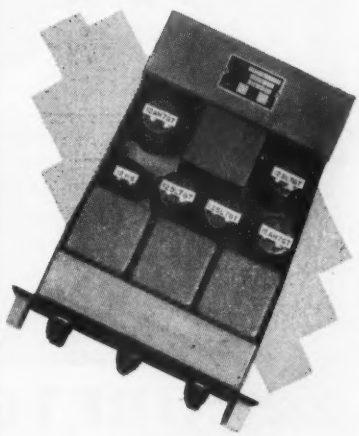

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new total depth. This section had little show of oil or gas but was drilled soft, according to report. Final tests will be in the Ellenburger from 12,530-13,087 ft.

Additional drilling in the new North Snyder field of Scurry County was announced by Standard Oil Co. of Texas. Locations have been staked east and southwest of the 1 Mrs. J. W. Brown, opener of the field. Both projects will go to 7,000 ft., with rotaries. One-half mile east of the discovery, Standard 22 Brown was drilling below 6,100 ft. South of the discovery, Standard 3-1 Brown was drilling below 6,276 ft. early in the week.

In Andrews County, Magnolia 2-11 University, NE SW Section 11, Block 13, University Survey, indicated a 1½-mile northwest extension to Wolfcamp pay in the Shafter Lake multiple-pay field. A 3-hour drill-stem test from 8,395-8,499 ft. brought gas to the top in 12 hours and 10 minutes and recovered 207 ft. of gas-cut mud, plus 920 ft. of heavily oil and gas-cut mud.

WEST TEXAS (DISTRICTS 8 & 7-C)
SUCCESSFUL WILDCAT

Reagan County: H. L. Hunt and Moore Exploration Co. 1-B University, Sec. 14, Blk. 12, University Sur., 7½ mi. SW Big Lake, pumped 8 bbl. 35°-grav. oil a day, Grayburg 2,390-2,479 ft., TD 2,481 ft.

WEST TEXAS (DISTRICTS 8 & 7-C)
WILDCAT FAILURES

Kent County: L. H. Wentz 1 L. B. Fuqua, Sec. 7, Blk. BB, PSL Sur., 4 mi. from N and 3½ mi. from W county lines, dry, TD 6,997 ft., San Andres 1,450 ft., Glorietta 2,223 ft., Clear Fork 2,431 ft., Reef lime 6,217 ft., elev. 2,295 ft.

Schleicher County: L. W. Elliott 1 V. G. Tisdale, Sec. 16, Blk. A, HE&WT Sur., 3½ mi. E Eldorado, dry, TD 3,142 ft., Cisco 2,709 ft., elev. 2,434 ft.

Scurry County: Sun Oil Co. and Ohio Oil Co. 1 Sally Helms, Sec. 636, Blk. 97, H&TC Sur., 20 mi. NE Snyder, dry, TD 7,524 ft., Strawn 6,576 ft., Ellenburger 7,258 ft., Cambrian 7,477 ft., pre-Cambrian 7,520 ft., elev. 2,122 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Crossroads field of Lea County, which last week had a confirmation well completed, this week had additional acreage added to the proven field. Mid-Continent Petroleum Corp. 1 Dessie Sawyer, NE SW 27-9s-36e, northwest offset to the discovery, recovered additional oil-cut mud on a drill-stem test from 11,991-12,100 ft. This latter test, open 40 minutes, recovered 3,000 ft. of water blanket and 630 ft. of oil-cut mud. It recovered the first shows of oil on a test from 11,743-11,806 ft. According to some reports, it topped the Devonian at 11,730 ft., or 7,691 ft., subsea, which would place it considerably higher structurally than the discovery. Total depth was 12,215 ft. Operators were running 5½-in. casing for completion attempt at the present depth. Last week it was reported the well would be drilled ahead to the Ellenburger. On the last reported core, from 12,199-207 ft., the recovery was 6 ft. of dolomite having heavy oil staining.

Southwest of the discovery, Mid-Continent 1-B U. D. Sawyer, NE NW 34-9s-36e, had a drilling break at 12,384 ft. which operators thought might be the top of the Devonian. It was drilled to 12,460 ft. and shut down for orders. Cores from 12,393-97 ft. recovered lime with heavy oil staining; from 12,397-12,410 ft. the yield was tight, finely crystalline lime, and from 12,410-20 ft. there was 10 ft. of shaly lime having pinpoint porosity and slight gas odor. Recovery was the same to 12,460 ft. Operators then ran a 30-minute drill-stem test from 12,378-12,460 ft., open 2 hours, using 3,500 ft. of water blanket. Gas did not show at the surface but the recovery was 1,445 ft. of oil-cut water blanket, 4,325 ft. of free oil, of 44° gravity, and 2,150 ft. of oil and gas-cut mud, plus 720 ft. of salt water. It was thought the latter water might be drilling water.

Stanolind Oil & Gas Co. 1 South Mattix Unit, SW NE 15-24s-37e, on the north edge of Langlie-Mattix shallow field, had possibilities of becoming a producer in the

Blinebry section, if it is dry in the lower formations. Contract depth is 10,000 ft. A 90-minute drill-stem test from 5,460-5,515 ft. brought gas to the surface in 12 minutes and recovered 390 ft. of free oil, plus 450 ft. of heavy oil and gas-cut mud. A second test at 5,499-5,565 ft. recovered drilling mud with no shows.

At 5,865-5,940 ft. the recovery on an hour test was drilling mud with no shows, but at 6,110-6,210 ft. gas came to the surface in 4 minutes, and the recovery was 360 ft. of heavy oil and gas-cut drilling mud. From 6,240-6,340 ft. the recovery was 330 ft. of slightly oil and gas-cut drilling mud.

CANADIAN FIELDS

Test East of Turner Valley Has Good Show

ABOUT 18 air miles due south of Calgary and 4 miles east of the town of Black Diamond, the Anglo-Black Diamond No. 1 wildcat halted coring and ran the first of a series of drill-stem tests with bottom hole at 9,022 ft.

The well, located in LSD 12, 12-20-2w5th, a few miles east of the Turner Valley field, topped the Madison limestone at 8,970 ft. and set 7-in. casing at 8,975 ft. First traces of porosity were encountered at 9,022 ft. and a drill-stem test was made. The first porosity entered correlates with the top part of the upper porous horizon at Turner Valley, where there is also a second porous zone, deeper in the Madison. Both zones are prospects for dry gas, wet (distillate-laden) gas, oil and gas, or water.

After the valve was opened a small flow of natural gas hit the surface in 20 minutes, and was measured at 50,000 cu. ft. daily rate. During the test, the gas volume increased as follows: one hour later gas volume was 75,000 cu. ft. daily; two hours later, 100,000 cu. ft. daily; after 3 hours, 160,000 cu. ft.; after 5 hours, 200,000 cu. ft.; after 16 hours the gas flow rate was up to 220,000 cu. ft. daily.

When the pipe was pulled, recovery consisted of 450 ft. of oil-cut mud, with no sign of salt, indicating that the zone so far penetrated is water-free. During the 16¼-hour test, fluid dripped from the end of the flare line and samples were recovered for analysis at regular intervals. At first, the fluid was largely water from the drilling mud. By the next morning, the flare line drip when analyzed consisted of about 75 per cent distillate or naphtha, and 25 per cent water (apparently from the drilling mud). Gravity of the naphtha samples was measured at 52° to 53° gravity. Coring is currently continuing below 9,028 ft. It is planned to core on about another 10 to 12 ft. and run a further drill-stem test.

Hanna.—The Hanna Petroleums No. 3, Basal Cretaceous sand oil discovery in LSD 14, 5-31-14w4th, about 90 miles northeast of Calgary, is being produced at a rate between 40 and 50 bbl. daily of 33°-gravity oil. During daily runs, about 5 to 6 hours duration, casing pressure averages about 500 psi. and tubing pressure about 200 psi. Oil is clean, with b.s. and w. cut less than 2 per cent. Next well is expected to be a west offset to Hanna No. 3.

Halfway Lake.—The Pacific-Sunray No. 1 well, wildcat at Halfway Lake, in LSD 11, 36-57-23w4th, northwest of Redwater, has set 7-in. casing at 2,900 ft., through the Lower Cretaceous sands that indicated a large natural gas potential on drill-stem tests. When markets warrant completion of the well, gun-perforations opposite the gas flow horizon will be made. This test was drilled to 4,393 ft., far into the Devonian, but failed to get oil production.

Redwater.—Anglo-Home-Redwater No. 3 well, LSD 9, 36-57-22w4th, has been placed on steady production, following acidizing.

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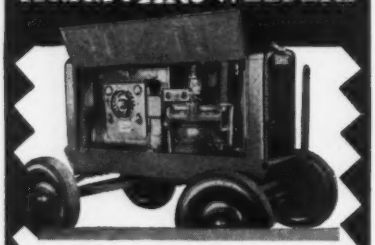

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OHIO, KENTUCKY

Sayre Pool Extended Location to Southwest

COLUMBUS.—Sayre pool in Perry County was extended a location to the southwest by Ohio Fuel Gas Co. 275 Sunday Creek Coal Co., Section 4, Pleasant Township. The Clinton was topped at 3,733 ft. and drilled to 3,744 ft. where the sand was too hard for further progress and the well was tubed at 657,000 cu. ft. natural. In Hopewell Township, Wasson & Co. 2 Murray Coble, Section 28, filled 950 ft. while drilling in and made 97 bbl. in 24 hours after shot. Clinton sand was reported at 2,930-67 ft. Quaker State Oil Co. 1 A. C. Coleman, Section 34, Madison Township, flowed 38 bbl. the first day after shot.

Hemlock Grove pool in Meigs County, nearly shut down for lack of only a partial oil outlet, had a ¼-mile east extension to its southern end. Nollem Oil & Gas Co. 1 Albert Spencer, Section 1, Bedford Township, made 70 bbl. in 24 hours after shot.

William Dempsey completed a fourth well in the new East Elyria pool. On Horace Abbe, Lot 24, Elyria Township, Lorain County, the well gaged 798,000 cu. ft. natural from the Clinton at 2,347-56 ft.

Pure Oil Co. 1 Osborne Hibbetts, Section 21, Union Township, Knox County, made 43 bbl. and 238,000 cu. ft. gas after shot from Clinton found at 2,890-2,912 ft. This is the first completion in the old Brinkhaven pool in a number of years.

One wildcat and 17 field locations were reported from 10 counties. Stark, Licking, Medina, and Perry each had three. Lancaster field led in completions with 7 out of 26.

EASTERN KENTUCKY

ASHLAND.—In Johnson County, 3-Q-80, Everett Conley is drilling at 1,780 ft. on 1 Williams on Mudlick Creek. Corniferous lime was topped at 1,565 ft. and operators were drilling to the Big Six Silurian sand. Well is located on the southeast flank of the Laurel Creek dome.

In Knott County, Hall & Ford at their 1 H. H. Smith failed to make a producer at a total depth of 5,217 ft. Gas pay at that depth was acidized but got negative results. Operators are now plugging back to make test of gas previously had in the Devonian black shale.

In Lee County, 19-N-69, Jack Kindred is shut down at 2,967 ft. on 1 C. J. Sipple. Water was had at present total depth in the St. Peter sand and casing is to be run before drilling ahead into the Knox dolomite.

EASTERN KENTUCKY WILDCAT FAILURE

Powell County: A. H. Carpenter et al 1 James Hall, dry, TD 3,201 ft., Corniferous 88 ft., Tyrone 1,106 ft., St. Peter 1,765 ft., Knox 1,783 ft., water.

WESTERN KENTUCKY

OWENSBORO.—The first results of testing at Sohio Petroleum Co. and Chester Oil Co. 1 Shivers heirs, 1-O-26, Henderson County, have been released. The well pumped on beam for the first 24 hours, 60 bbl. of oil and 71 bbl. of water. For the second 24-hour period, it made 31 bbl. of oil and 52 bbl. of water. The well is a little more than 1 mile southwest of Birk City field.

Rapid development continued in the area north of Griffiths pool in Daviess County as operators completed five shallow Palestine wells. These wells are in Sections 4, 5, and 7 of P-28.

Near the eastern edge of Daviess County, Great Lakes Carbon Co. completed 7-M Hazel-Aud-Miller, 21-P-32, Roby pool, with an initial production of 36 bbl. per day from the McClosky at 954-96 ft. after treatment with 2,500 gal. of acid.

The Webster County deep test, Pure Oil Co. and Ashland Oil & Refining Co. 1 M. L. Walker, 22-N-24, was drilling at 5,695 ft. The test is scheduled to go to 7,500 ft.

WESTERN KENTUCKY WILDCAT FAILURES

McLean County: J. C. Miller and Ashland Oil & Refining Co. 1 R. C. Jordan, NW SW NE 5-N-26, dry, TD 2,691 ft.

INDIANA

EVANSVILLE.—George C. Schoonmaker has treated the McClosky with acid at 1 Bishop Grimmelsman, SE SE SE 9-8s-14w, a possible north extension to College pool in Posey County. Operator is cleaning out for further tests. The well had a recovery of 50 ft. of gas, 95 ft. of oil, and 25 ft. of oil-cut mud on a 2-hour drill-stem test of the Palestine at 1,730-40 ft.

Coy Oil Co. has completed 2 Charles Black, SE NE NE 11-7s-14w, on the south edge of Mt. Vernon pool in Posey County. The well was completed in the Waltersburg for 49 bbl. per day. Total depth is 2,012 ft., plugged back to 1,986 ft.

The area west of Cypress in Vanderburgh County had two completions for the week. Ashland Oil & Refining Co. et al 1 Brose, SW NE SW 9-7s-11w, was completed in the Waltersburg at 1,649-51 ft. with a pumping potential of 40 bbl. per day. C. E. O'Neal and Paul Farmer completed 1 Margaret Schenk, SE SE SE 16-7s-11w, in the Mansfield at 909-30 ft. for 22 bbl. per day on pump.

INDIANA WILDCAT FAILURES

Daviess County: Coy Oil Co. 1 Cecil V. Wildman, SE SW SE 21-2n-7w, dry, TD 2,676 ft.

Miami County: R. W. Cooper 1 C. C. Howard, NW NE SE 21-27n-5e, dry TD 938 ft.

Sullivan County: F. B. Cline 1 Scott Snyder, NW NE SE 36-7n-9w, dry, TD 1,740 ft.

Vanderburgh County: J. A. Talbot 1 Butterfield, NE NW SE 4-8s-11w, dry, TD 2,580 ft.

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ILLINOIS

Roland Pool Extension Hits in McClosky

MATTOON.—Kingwood Oil Co. 1 William C. Hill, NE NE SW 36-6s-8e, White County, is showing for a good north extension to Roland pool. A drill-stem test of the McClosky at 3,024-43 ft. had gas at the surface in 2 minutes and flowed clean oil in 17 minutes with no gages reported. The well is about ½ mile north of Roland pool and about 1 mile south of Iron pool. The McClosky is productive in both of these pools.

In the area about 5 miles northwest of Shawneetown, George S. Engle is delayed by the weather in completing 1 R. V. Stinson, NE SE SW 9-9s-9e, Galatin County. This well opens a new pay zone, the Hardinsburg, for the area and is reported to have swabbed 60 bbl. of oil in 16 hours from pay at 2,119-35 ft.

In Clay County, Russell P. Johnson and Calvert & Willis have set casing at 1 Pierce-Weiler, SW SW SW 19-3n-8e, for additional tests of the O'Hara, Casing was set at 3,013 ft. and total depth is 3,087 ft.

C. E. Brehm is cleaning out for further test of the Cypress at 1 Blackford, SE NW NE 34-3s-10e, White County. The well was given a 40-qt. shot in the Cypress. On last report, the well swabbed 3 bbl. of oil per hour.

National Associated Petroleum and Continental Oil Co. have completed two more good Rosiclare wells in the recently opened North Assumption pool in Christian County. These operators completed 9 Lawrence, NW SE NE 9-13n-1e, with an initial production of 475 bbl. per day and 1 H. Bilveu, NW NW SW 10-13n-1e, with an initial production of 410 bbl. per day.

ILLINOIS SUCCESSFUL WILDCAT

Wabash County: C. E. Skiles 1 Ewald heirs, SW SE NW 5-2s-13w, IP 103 bbl., Benoist, 2,580-92 ft., TD 2,594 ft.

ILLINOIS WILDCAT FAILURES

Edgar County: Livingood et al 1 Stoneburner, NE SW SE 3-13n-13w, dry, TD 544 ft.

Jasper County: Baines-Lomelino 1 R. Worchester, NW SW NW 22-5n-14w, dry, TD 2,944 ft.

Madison County: Reward Oil Co. 1 J. Weder, NW NE NE 33-5n-5w, dry, TD 1,995 ft.

Marion County: H. Luttrell 1 Jones-Robb, NE NE SE 19-4n-3e, dry, TD 2,032 ft.

Wabash County: M & M Drilling Co. and Ashland Oil & Refining Co. 1 Brian et al, NE NE NW 30-1s-13w, dry, TD 2,941 ft.

Williamson County: R. L. Cantine and C. S. Hardin 1 Jones Brothers, SE NW SW 29-10s-2e, dry, TD 1,998 ft.

Texas Commission Hears Reports on 26 Oil Fields

(Continued from page 51)

Thompson, North Thompson, and South Thompson, Fort Bend County.—Humble plans to have a gas processing plant with a 19,500-M.c.f. capacity in operation by June 1949. Over 15,000 M.c.f. is being flared at present.

Slick-Wilcox, Goliad County.—Flaring of 9,000 M.c.f. daily is expected to be stopped within 12 months if present negotiations are successful.

Porter, Karnes County.—Operators plan to reinject the gas into the reservoir, however, no date was given as to when facilities would be ready.

Richard King, Nueces County.—Program to utilize 95 per cent of flared gas will be in operation within few days. Commission granted postponement until February 8 in hearing on this field.

Sun and North Sun, Starr County.—A plan proposed by Sun Oil Co. to store produced gas in the C-1 sand has already been approved by the commission. Injection will start around March 15.

Todd Deep and Todd Deep Crinoidal, Crockett County.—Gas processing plant being built, but no market found for residue. Operators say it is 60 miles to nearest pipe line, and injection into reservoir is unfeasible because of strong water drives in reservoirs.

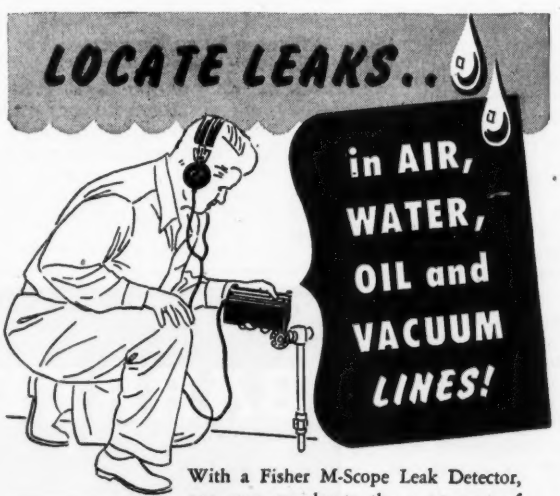
Block 31 Devonian.—All gas to be returned to reservoir by July 1, 1949.

South Cowden, Ector County.—All gas to be utilized by April.

Fuhrman - Mascho, Andrews County.—Some 3,506 M.c.f. of sour gas is not being utilized at present. Operators say it is impossible to develop a market for the gas.

Oyster Bayou, Chambers County.—Flaring expected to stop by March 1.

Chapelhill, Smith County.—Flaring expected to stop by June 1.



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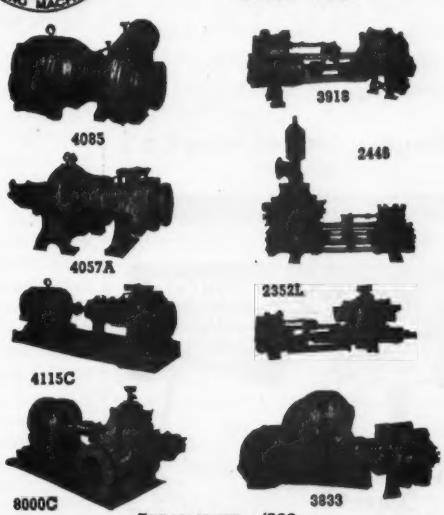

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STANDCO BRAKE LINING
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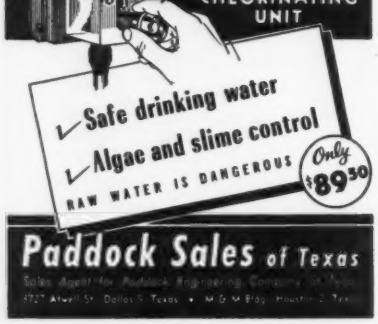

Paddock Sales of Texas
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Hugoton Hearings Halted Pending Court Decision

(Continued from page 51)

scope of its jurisdiction, as too sweeping even though supported by Supreme Court decisions.

At the same time, it said, the commission itself has defined its own position and it has found as a fact that "it has been the practice in the natural-gas industry for companies to trade freely in gas leases, and the commission has never heretofore asserted the right to regulate transfers of such leases" and the commission has stated officially that it "is of the opinion that it was the intent of Congress that the control of production or gathering of natural gas should remain a function of the states and that the Natural Gas Act should not provide for regulation of those subjects."

Argument of the commission that the reserves involved had been considered in acting on previous matters brought before it, while "ingenious and plausible," proves too much, the court continued, and if it prevails "a gas company which had had commission action on its rate base could never sell an outworn truck nor an obsolete drilling machine without getting commission approval" and likewise would be compelled to take to the commission every proposed transfer of a 10-acre lease in exchange for another.

"In other words, by this process, it seems to us, the commission will have taken over the area of regulation of facilities for gas production which by express terms of section 1 of the statute were to be excluded from commission regulation," the court commented.

"The appellant's argument points further to the commission's order of November 10 in which it directed the company to show cause why the transfer of leases should not be set aside and directed maintenance of the status quo pending determination," the opinion concluded. "This is an order no doubt. But if it is not a valid order because beyond commission jurisdiction, the commission cannot have court help to enforce it. We have endeavored to set out above why we think an order interfering with the transfer of these leases would go beyond commission authority. . . .

"If we were convinced that the commission had the proper grounds for asking for relief, we think an injunction would accomplish everything necessary to prevent consumation of the transaction. It is not because we do not think the equitable powers of the District Court are insufficient, but because we do not think the facts call for their exercise, that we are approving the court's refusal of relief in this case."

Wherry Report Flays Big Oil Companies

(Continued from page 54)

gress, including a study of gas wastage and the establishment of "true" conservation practices in the states, and some method of reestablishing competition between the producing states.

He called for a study of the Bureau of Mines monthly forecasts of demand, with the suggestion that they might be prohibited and the bureau's activities limited to statistical compilations of past transactions; and review of the Interstate Oil Compact leading either to repeal of the authority under which the commission operates or the adoption of amendments "to safeguard the public interests." These inquiries should be accompanied by an inquiry into the operation of the Connally Hot Oil Act, also with a view to repeal or amendment to make it applicable only when the producing states follow sound engineering principles of conservation.

Other recommendations called for a study of pipe lines and their divorce from shipper ownership; delay of the construction of the Trans-Arabian pipe line until domestic supply of steel has caught up with demand; and vigorous enforcement of existing laws and study of the need for new legislation to free the channels of trade from artificial obstruction.

"The continued concentration of the control of the oil industry, from reserves in the ground down through to the tank truck or filling station sale to the consumer, in the hands of a few integrated companies presents a real challenge to American ideas of free enterprise and the preservation of small business," Wherry concluded.

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I.P.A.A. Opposes Extension Of Reciprocal Trade Act

WASHINGTON.—Charging that the Reciprocal Trade Agreements program has nullified the intention of Congress to encourage domestic oil production expressed in 1932 when it established an excise tax on imports, independent petroleum operators, through L. Dan Jones, attorney for the Independent Petroleum Association of America, last week opposed extension of the Reciprocal Trade Agreements Act as proposed by President Truman.

Testifying before the House ways and means committee, Jones declared the program is operating to make this country dependent upon foreign oil and is encouraging a world oil monopoly, pointing out that in the past decade we have switched from a net export of 355,000 bbl. daily to a net import of more than 200,000 bbl.

"In view of the essentiality of oil to our military security," he said, "we think this alone presents a most serious problem in regard to assuring a national policy as to oil that is in the best interest of the nation."

Under the incentive of the import tax, Jones told the committee, the domestic industry developed to the point where it had a reserve producing capacity of 1,000,000 bbl. daily above requirements when we entered the last war. In the past year the industry has demonstrated its ability to rebuild reserve capacity "but the encouragement being given to imported oil is imposing an artificial limitation on the domestic industry's activities," he said.

Jones asserted that seven companies, five of them American, dominate the industry in the principal producing countries outside the United States, except Russia and Mexico; six of these companies also dominate the purchase of crude in this country through their refinery operations, which constitute about 50 per cent of the United States' total.

"The six companies involved may compete with each other in the United States but the tie of mutual interest is present in foreign producing areas and is evidenced by existing partnerships," Jones testified.

"The monopolistic trend in foreign petroleum development is of much concern to the independent oil producers in the United States. The large foreign reserves that have been developed are now seeking a market. The most readily available and profitable market is in the United States."

Jones emphasized the I.P.A.A. has never condemned the American companies for developing foreign reserves and believes they can contribute to world prosperity. However, he argued, these companies, if not properly directed, have potential power to destroy the domestic industry.

"The beneficial results of the trade-agreement concessions made on petroleum are not so much beneficial trade concessions to the foreign countries involved or to their citizens, but instead primarily constitute direct incentive to six companies, five of which are American citizens," Jones declared. "Therefore, as to petroleum the bulk of the trade-agreement benefits do not flow to the general public of the United States or the foreign country involved, but to five American companies."

Conroe Field Allowables To Be Subject of Hearing

HOUSTON.—Possible amendments to field rules for the big Conroe field of Montgomery County, will be the subject of a March 15 hearing to be held by the Railroad Commission.

Testimony will be received as to whether the current method of allocating allowable oil production to individual wells should be amended. Currently, allowables are determined on a basis of 50 per cent potential and 50 per cent acreage. Elimination of potential as a factor will be considered.

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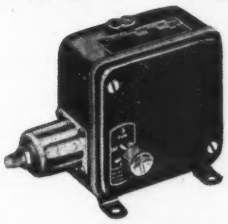
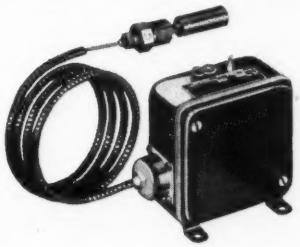


PENN SAFETY CONTROLS



Pictured above is the *Oil Pressure Control* which protects against damage which may result from low oil level, clogged or broken oil lines or oil pump breakdown. At left is the *Water Temperature Control* which protects against damage through loss or overheating of cooling water.

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Write for detailed information on Penn safety controls. Ask for Bulletin E-100B. **Penn Electric Switch Co., Goshen, Ind.**

Export Division: 13 East 40th Street, New York 16, N.Y., U.S.A. In Canada: Penn Controls Ltd., Toronto, Ontario.

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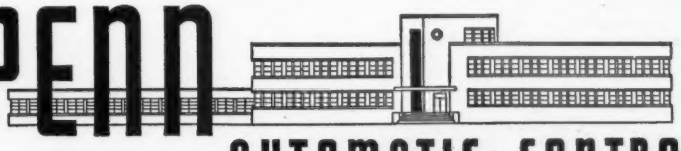


AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

STATISTICS and T

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JANUARY 29, 1949

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	22	11	0	*11	21,940	82	174	0	0	0	0	0	0	0	0	0	0
Pennsylvania	32	14	3	15	62,332	148	321	0	0	0	0	0	0	0	0	0	0
West Virginia	12	2	6	4	47,611	45	74	0	0	1	2	3	0	0	1	2	3
Ohio	25	12	7	†6	60,091	96	108	0	0	0	0	0	0	0	0	3	3
Indiana	17	6	0	11	30,187	87	79	0	0	0	4	4	1	0	0	16	17
Kentucky	22	14	1	†7	29,494	56	62	0	0	0	2	2	0	0	0	4	4
Illinois	35	19	0	16	84,815	174	202	1	0	0	6	7	3	0	0	33	36
Michigan	16	6	2	8	34,560	74	78	1	0	0	6	7	2	0	0	31	33
Kansas	43	26	0	17	140,725	230	273	0	0	0	7	7	2	0	0	34	36
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oklahoma	57	30	2	25	220,251	307	363	4	0	1	9	14	17	3	1	48	69
Texas	216	116	18	82	845,796	1,055	985	5	1	3	41	50	34	1	8	180	223
North Central (Dist. 7-B & 9)	74	35	0	39	189,323	334	295	2	0	0	16	18	18	0	0	78	96
West (Dist. 7-C & 8)	40	32	0	8	208,552	241	258	1	0	0	3	4	4	0	0	13	17
Panhandle (Dist. 10)	28	14	11	3	85,610	89	59	0	0	0	0	0	0	0	0	0	0
Eastern (Dist. 5 & 6)	12	7	0	5	62,256	51	58	0	0	0	3	3	0	0	0	10	10
Gulf Coast (Dist. 2 & 3)	22	8	6	8	138,795	167	162	0	1	3	7	11	6	1	7	40	54
Southwest (Dist. 1 & 4)	40	20	1	19	161,260	173	153	2	0	0	12	14	6	0	1	39	46
Louisiana	33	22	3	8	210,200	188	173	1	0	0	5	6	2	0	0	15	17
Northern	18	13	2	†3	55,891	113	121	0	0	0	2	2	0	0	0	8	8
Southern	15	9	1	5	154,309	75	52	1	0	0	3	4	2	0	0	7	9
Arkansas	9	3	0	6	39,836	12	40	1	0	0	6	7	1	0	0	7	8
Mississippi	6	4	0	2	32,018	28	39	0	0	0	2	2	0	0	1	8	9
Southeastern States	0	0	0	0	0	4	5	0	0	0	0	0	0	0	0	3	3
Montana	7	5	0	2	19,969	17	27	0	0	0	1	1	1	0	0	2	3
Wyoming	11	9	0	2	53,434	35	42	0	0	0	1	1	2	0	0	6	8
Colorado-Utah	1	0	0	1	5,627	18	29	0	0	0	1	1	1	0	0	5	6
New Mexico	5	4	1	0	21,525	38	66	0	0	0	0	0	1	0	0	3	4
California	40	30	0	10	124,096	213	241	0	0	0	9	9	5	0	0	36	41
Total United States	609	333	43	233	2,084,507	2,907	3,381	13	1	5	102	121	72	4	11	436	523
Total previous week	719	415	58	246	2,627,746	2,298	2,707	9	1	3	93	106	59	3	6	334	402
Total January 31, 1948	674	368	56	250	2,194,486			8	0	5	100	113	62	1	21	463	547

Service wells included: *11, †1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.)

A.P.I. REFINERY REPORT, WEEK ENDED JANUARY 22

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	786	2,147	75	1,722	1,571	23,854	9,663	21,451	12,286
Appalachian:									
District 1	100	301	53	89	110	2,679	408	938	450
District 2	71	277	27	38	125	1,406	129	222	241
Ind., Ill., Ky.	994	3,376	538	935	1,169	24,563	3,846	10,198	5,313
Okla., Kans., Mo.	429	1,612	183	517	535	11,045	1,130	4,359	2,717
Inland Texas	241	1,106	99	194	386	4,290	603	687	1,175
Texas Gulf Coast	1,401	4,485	780	2,100	1,753	18,733	3,022	12,554	10,710
La. Gulf Coast	446	1,268	418	850	457	6,158	1,814	3,689	3,632
N. La. and Ark.	60	195	42	40	89	2,446	532	959	324
Rocky Mountain:									
New Mexico	13	54	7	26	27	104	35	49	36
Other Rocky Mtn.	158	509	36	214	243	2,969	168	1,346	962
California	857	2,631	96	1,219	2,279	13,340	775	12,294	47,229
Jan. 22, 1949	5,556	17,961	2,354	7,944	8,744	111,587	22,125	68,746	85,075
Jan. 15, 1949	5,721	18,432	2,762	7,749	9,187	109,210	22,593	70,491	85,609
Jan. 24, 1948	5,446	16,747	2,403	7,718	9,182	100,586	11,997	42,402	51,094

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 252,537,000 bbl. as of January 15—up 1,535,000 bbl. One year ago 228,076,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas†	$2.65	Pecos County, Texas (Yates)	2.35
Kettleman Hills, California*	2.14	Bradford, Pennsylvania	4.00
Beauregard Parish	2.60	Eastern Ill. and Western Ind.†	2.77
Illinois Basin	2.77	Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

XUM

TRENDS

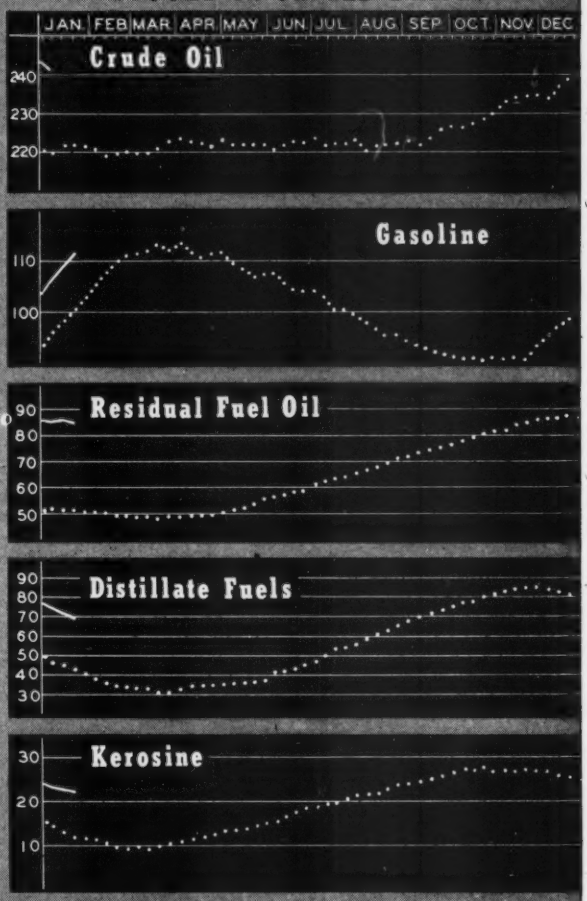
DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 29 crude oil	B. of M. Jan. demand	Jan. 22 crude oil
Alabama	1,350	1,700	1,150
Arkansas	83,500	84,000	83,100
California	949,800	950,000	949,700
Colorado	*62,150	52,000	64,650
Eastern	61,910	62,300	61,800
Florida	1,250	1,300	1,250
Illinois	179,000	165,000	180,600
Indiana	23,100	21,000	23,100
Kansas	295,500	300,000	292,350
Kentucky	23,700	22,000	23,800
Louisiana	504,250	483,000	502,450
North Louisiana	119,200	.....	117,400
South Louisiana	385,050	.....	385,050
Michigan	46,350	45,000	45,300
Mississippi	110,550	126,000	118,650
Montana	24,500	24,000	25,400
Nebraska	300	700	300
New Mexico	135,500	127,000	135,500
Oklahoma	453,050	425,000	440,500
Texas	2,333,490	2,450,000	2,333,490
Dist. 1 (Southwest)	26,910	.....	26,910
Dist. 2 (Southwest)	162,025	.....	162,025
Dist. 4 (Southwest)	225,550	.....	225,550
Dist. 3 (Gulf Coast)	452,755	.....	452,755
Dist. 5 (Eastern)	46,150	.....	46,150
Dist. 6 (Eastern)	115,475	.....	115,475
East Texas field	289,000	.....	289,000
Dist. 7-C (West)	48,350	.....	48,350
Dist. 8 (West)	676,850	.....	676,850
Dist. 7-B (W. Central)	62,600	.....	62,600
Dist. 9 (N. Central)	138,625	.....	138,625
Dist. 10 (Panhandle)	89,200	.....	89,200
Wyoming	137,500	140,000	145,500
Total United States	†5,426,750	5,480,000	5,428,590
Change from prev. wk., dn.	1,840		

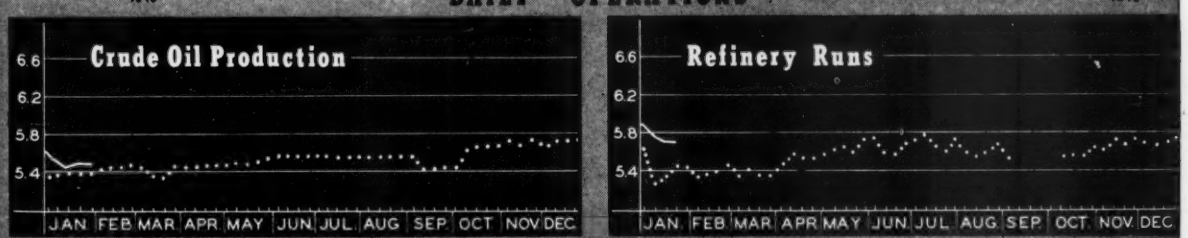
Total production January 1-January 29 . . ‡160,242,555 bbl.
Same period last year (crude plus cond.) . . 156,285,555 bbl.

*Incl. 150 bbl. Utah production. †Not incl. 81,725 bbl. condensate. ‡Incl. 2,366,675 bbl. condensate.

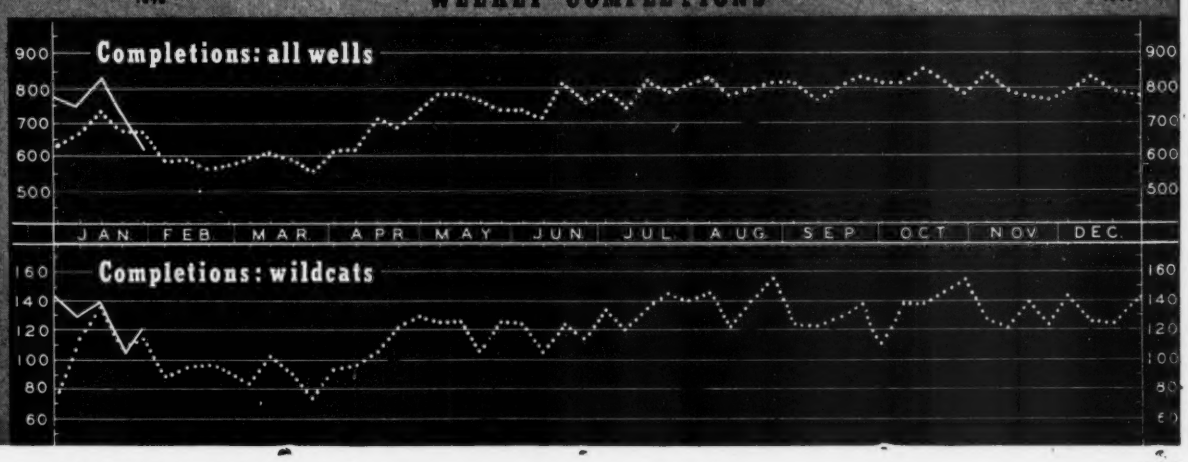
STOCKS IN UNITED STATES — 1948 ···· 1949



DAILY OPERATIONS



WEEKLY COMPLETIONS



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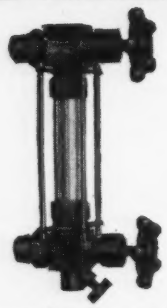

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MARKETS

A GENERALLY weakened products and crude market failed to make any appreciable show of strength over the past week. However, in the Mid-Continent area the recent subfreezing temperatures began to increase demand for light burning oils, but not in sufficient quantity to strengthen price levels. In the East Coast area generally mild weather continued and light and residual oils remained very weak. Despite the recent cuts in heavy fuel-oil prices further shading was still necessary to move some of the material. Trading on the spot market in the Gulf Coast remained relatively slack.

Reflecting the normal seasonal weakening in the natural-gasoline market a reduction of 1 cent per gallon was noted early this week. The new quoted prices bring Grade 26-70, f.o.b. Group 3, to 7½ cents per gallon; and f.o.b. North Texas, 7 cents.

On the West Coast four major oil companies reduced the price of heavy industrial fuel oils by 25 cents per barrel. Medium and light grades were reduced 15 cents per barrel. A statement by one of the companies in explaining the reduction said that "supplies of crude oil which go into the production of heavy industrial fuels are currently being produced in excess of the demand." The company also announced a reduction of 25 cents per barrel in the price it will pay for 14°-gravity crude oil.

East Coast Area

Despite the recent series of price reductions on the East Coast, shading of posted quotations for heavy fuel oil was reported last week in New York Harbor.

Major suppliers were quoting $2.30 per barrel for No. 6 at the barge level, but reports were material was available on the open market at prices only slightly above $2.

Further price concessions could result from continued heavy production and slack consumption, though heavy oil, in view of its now favorable competitive price level, is expected to take some consumers using coal.

The light heating-oil market remained in poor condition. What little of this product was sought was at prices ranging around 8½ cents. Demand for kerosine was reported only slightly better.

Socony-Vacuum Oil Co., Inc., early last week made its fourth recent price reduction in No. 5 fuel oil. The new cut of 25 cents a barrel brought the price in New York to $2.95 barge and $3.05 tank car.

Mid-Continent Area

Some increase in spot-market demand for light burning oils was noted in the Mid-Continent area last week, particularly for range oil and No. 1 suppliers reported that high-level stocks and high production of No. 2 has not been taxed enough to strengthen price levels. This material was reported by one refiner as being moved at 8 to 8¼ cents for straw colored fuel, while some shipments were said to be made at as low as 7½ cents for dark material.

While generally the tone of the products market in the Mid-Continent area was stronger, gasoline continued slow. Few shipments were reported and most sales were at below published prices. Movement of No. 6 continued poor, suppliers said. However, one Mid-Continent refiner said that he had sold several cars at $1.40 and another shipment at $1.60 on the spot market. Most sales, however, were reported at prices considerably below these prices.

Representative Quotations

Representative spot-market quotations of leading suppliers as of January 31, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10-10¼	12.0-12.4* 11.0-12†	10.3-12.5
Premium gasoline, 78-80 octane	10¾-11	12.0-13.4	11.0-13.5
42-44 w.w. kerosine	9¼-9½	10.3- ...	9.1-10.5
No. 2 straw fuel oil	8¼-8¾	9.1- ...	9-9½
No. 6 residual	$1.40-1.50	$2.35-2.45	$2.05-2.08

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	7½	7	7¼
Grade 18-55	9	8.4	8.7

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	12-13.5
750 vis., No. 3-4 neutral	15-16.5
2,000 No. 5-6 neutral	17-18.5

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	27
200 vis., No. 3 neutral, 0-10 pp.	17

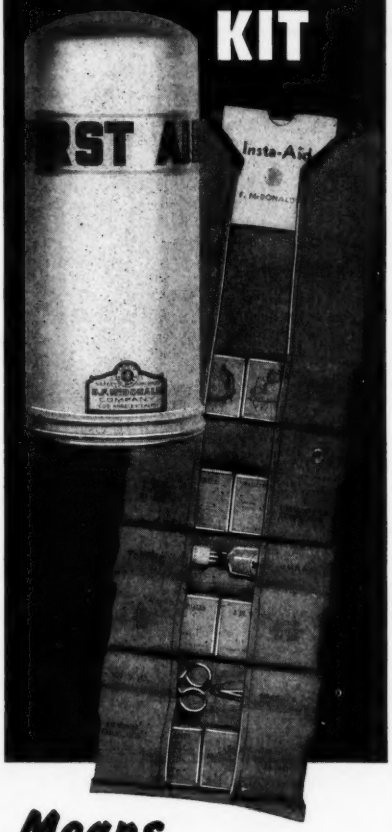
Western Pennsylvania

144-155 vs. 10 p.t. bright stock	27.0-40.5
180 vis. p.t. neutral	27.5-38.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	8

McDONALD KANISTER KIT



Means Immediate First Aid

Time is all important to workers injured out of immediate reach of medical facilities or first aid station. The McDonald Kanister Kit saves precious time by providing essential first aid materials *immediately* for mine operators, truck drivers, yardmen, etc. The dust proof, waterproof, corrosion proof canister is easily mounted on vehicles or walls. Roll-up kit may be held on forearm allowing free use of both hands keeping materials off ground away from possible contamination. Avaliable in standard assortments or made up to required specifications.

Write for bulletin and prices.

B. F. McDONALD CO.

Manufacturers & Distributors of Industrial Safety Equipment

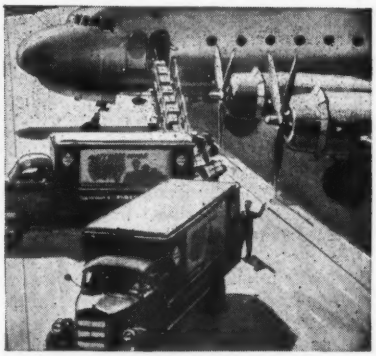
Safety FROM HEAD TO FOOT

5112 SOUTH HOOVER STREET
LOS ANGELES 37, CALIFORNIA
Other Offices in San Francisco & Houston

$5.07 saved a contract ...and a man's business

Special switches were needed to complete an electrical instrument contract. Late delivery of finished items would kill chances of future orders and lay off men. Switches were 1100 miles away, but Air Express delivered the 15-lb. package at 3 A.M. — 8 hours after pick-up. Cost, only $5.07. Air Express now used regularly. Keeps down inventory, improves customer service by early delivery.

Low as $5.07 was, remember Air Express rate *included* door-to-door service, receipt for shipment and more protection. It's the world's fastest shipping service that *every* business uses with profit.



World's finest Scheduled Airline fleet carries Air Express. 24-hour service — speeds up to 5 miles a minute. Direct to over 1000 airport cities; air-rail for 22,000 off-airline offices.

FACTS on low Air Express rates:

17-lb. carton of hearing aids goes 900 miles for $4.70.
12 lbs. of table delicacies goes 600 miles for $2.53.
(Same day delivery in both cases if you *ship early.*)

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
AIR EXPRESS GETS THERE FIRST

Rates include special pick-up and delivery door to door in principal towns and cities

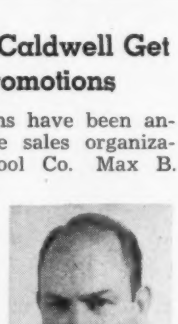
AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE SCHEDULED AIRLINES OF THE U.S.

EQUIPMENT MEN ... in the News

Campbell and Caldwell Get Hughes Tool Promotions

Several promotions have been announced within the sales organization of Hughes Tool Co. Max B.

M. B. CAMPBELL



C. B. CALDWELL

Campbell, former special representative in charge of the Dallas office, has been made division manager of the West Texas-New Mexico division, with headquarters in Midland.

Charles B. (Chuck) Caldwell, former special representative in Oklahoma City, has been promoted to special representative in charge of the Dallas office.

Promoted to newly created positions as regional office managers were the following: W. Clyde McMahon, former assistant office manager of the Houston office; W. O. Watson, former division office manager of the Gulf Coast division; and R. D. Hood, former division office manager of the Oklahoma-Kansas division.

D. W. Chandler, H. W. Harms, and H. C. Rowland, division engineers, have been promoted to newly created positions as regional engineers in the southern, northern, and western regions respectively. J. R. Kunkel, former sales representative at Seminole, Okla., has been promoted to district manager of the north Midland district with headquarters in Andrews, Tex. S. R. Mays, former sales representative at Midland, has been promoted to district manager of the south Midland district, with headquarters at Midland.

M. G. Clarke, Jr., formerly sales representative at Seminole, has been promoted to special representative in Pittsburgh, where he will handle commercial activities for the company at their new flashweld plant located at Walker's Mills, Pa.

Kaiser Appoints Hogan

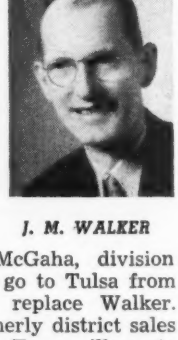
Rand Hogan has been appointed assistant district sales manager of Kaiser Steel Co. for northern California. Hogan will be in temporary charge of the northern California district sales office during the absence of Norman Balaam.

Kobe Promotes Elner to Southern Sales Manager

Ray Elner, formerly assistant to Kobe, Inc.'s Mid-Continent general manager, Russell G. Ralph, has been promoted to manager of the southern sales area. In his new position, he will be responsible for Kobe sales in New Mexico, West and East Texas, the Gulf Coast, Louisiana, Mississippi, and Arkansas. Offices for the southern sales area have been opened in Fort Worth.

Lane-Wells Promotes J. M. Walker to Export Engineer

J. Murray Walker, division sales engineer, Mid-Continent division, Lane-Wells Co., with offices in Tulsa, has been promoted to export sales engineer for the company and has been transferred to Los Angeles.



J. M. WALKER

S. W. (Sandy) McGaha, division sales engineer, will go to Tulsa from Oklahoma City to replace Walker. John M. Terry, formerly district sales engineer at Pampa, Tex., will go to Oklahoma City to replace McGaha.

Walker joined Lane-Wells in 1937 when it bought out Alexander Anderson, Inc., an oil-well directional-survey service of Fullerton, Calif., with which Walker had served a number of years. He was made district superintendent in California for Lane-Wells at that time and a year later went to Calgary, Canada, as branch manager, where he remained for 3 years. He was then transferred to Oklahoma City as district superintendent and 3 years later went to Tulsa in the position he has held until this current promotion.

Boller Heads Alloy Office

Alloy Steel Products Co., Linden, N. J., has opened a New York sales office with Richard E. Boller, Jr., as district manager. Associated with Boller will be Ralph O. Dale, Henry O. Harley, and Elliot A. Baines as sales representatives.

Lewis and Hilleary Awarded Fairbanks-Morse Promotions

O. O. LEWIS

H. L. HILLEARY

A series of promotions and changes in the sales division of Fairbanks, Morse & Co., Chicago, was recently announced. O. O. Lewis, until a short time ago assistant sales manager, has been promoted to sales manager.

Harry L. Hilleary, who for the past 17 years has been manager of the firm's St. Louis branch, is being transferred to the company's headquarters office in Chicago, having been promoted to the position of assistant sales manager.

L. A. Weom, manager of the pump division, has been transferred to St. Louis to become branch-house manager, succeeding Hilleary. Donald T. Johnstone, assistant manager of the pump division, succeeds Weom as manager of the pump division with offices in Chicago.

Fischer, Porter Sends Schnacky to Buffalo

J. F. Schnacky, chemical engineer, Fischer & Porter Co., has been transferred from Hatboro, Pa., to the Buffalo district office to function as a district engineer, assistant to the manager of the Buffalo territory. During the early part of 1948 Schnacky was engaged by Allis-Chalmers Manufacturing Co., in the plant design of solvent-extraction units. Since then he has been with Fischer & Porter at Hatboro aiding in the design of chemical dispensing and chemical-plant process-control systems.

Reeves Joins Oliver

Thomas C. Reeves has joined Oliver United Filters, Inc., on its eastern sales division staff. Reeves, a graduate of Syracuse University, is widely experienced in the chemical field and comes to Oliver United Filters from the position of chief engineer of Sherwin-Williams Co. plant at Bound Brook, N. J.

Matlack to Manage Brown Instrument's N. Y. Branch

Warren W. Matlack has been named industrial manager of the New York City branch of Brown Instrument's division of Minneapolis - Honeywell Regulator Co., it is announced by William H. Steinkamp, Brown field sales manager.

Matlack, who succeeds O. B. Wilson, now regional sales manager for the East, Central, and Southeast, has been with Brown company 18 years and has been the company's district manager at Albany, N. Y., for several years.

Derrick Made Assistant Sales Manager of Penflex

Pennsylvania Flexible Metallic Tubing Co. has appointed James R. Derrick as assistant sales manager. Derrick has been with the company for some time and has a vast amount of experience in the selling and application of flexible tubing throughout the industry.

Mitchell to Make Failing Equipment in England

George E. Failing Supply Co., Enid, Okla., manufacturer of portable drilling and exploration equipment, has licensed Mitchell Engineering Co., Ltd., of England to manufacture its line of drilling equipment in its plant located at Peterborough, 80 miles north of London. This market could not otherwise be served due to the dollar shortage.

Mitchell Engineering comprises some 18 different branches engaged in various lines of manufacturing and construction work. E. L. Alexander, Failing's chief engineer, and Everett P. Carley, design engineer, have spent several months in England working with Mitchell engineers on the design of the equipment to be built there. The English-built rig will have a capacity of 2,500 ft. with 2⅞-in. drill pipe; 1,650 ft. with 2⅞-in. drill pipe; and 1,000 ft. with 3½-in. drill pipe.

Thornhill-Craver Names Moore Sales Manager

Mike Moore has been appointed sales manager for Thornhill - Craver Co., Houston. Moore formerly held the position of salesman for the company, having joined it in 1947. Prior to that time he was oil-field equipment manufacturer's representative in Oklahoma.

Oil Well Supply Shifts Personnel in Texas

Three personnel changes in Oil Well Supply Co.'s central midwest division have been announced. G. L. Fabj, district material supervisor at Midland, has been transferred to the production planning and procurement department at the company's Dallas headquarters. Fabj is succeeded at Midland by Willis Blackwell, who has been manager of the company's Odessa, Tex., store since June 1948. J. O. Donaldson has been named manager of the Odessa store. A 1924 graduate of University of Texas, Fabj joined Oilwell in 1943 as a field auditor and became district material supervisor at Midland in 1946.

Cook Named to Byron Jackson Export Post

Appointment of W. S. Cook as assistant to B. A. Hilliard, manager of export for Byron Jackson Co., was recently announced by O. W. Morgan, Jr., general sales manager.

Prior to the war Cook attended University of Southern California. Working in the oil fields since his discharge he joined Byron Jackson in April 1947.

Smith Tool Promotes Thompson and Sayers

Paul Thompson and Jim Sayers have been promoted to division managers for H. C. Smith Oil Tool Co. Thompson has been named division manager of southern Oklahoma and will make his headquarters at Duncan, Okla. He has been with the company for 10 years and was previously in the northern Oklahoma division. Sayers has been appointed division manager of northern Oklahoma with headquarters at Oklahoma City. He joined the company in 1940.

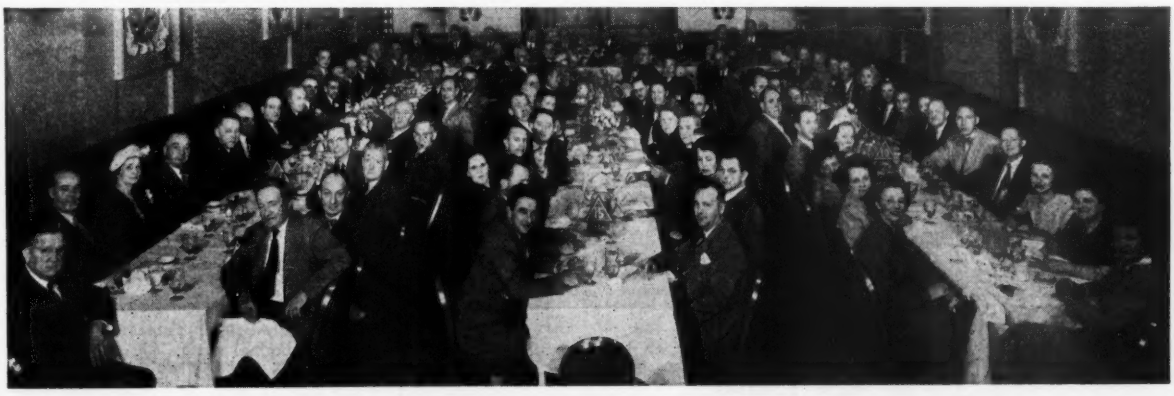
Wickwire Names Klingler to Mid-Continent Sales Area

E. L. Klingler will direct the sale of Wickwire rope in the Mid-Continent area, including Houston and Abilene, Tex., and Tulsa, for Wickwire Spencer Steel Division of Colorado Fuel & Iron Corp. After February 1 he will be located at Houston.

Klingler has a background of 19 years in the wire rope industry including production, engineering, and sales. He previously spent 6 years in the Mid-Continent area as a wire-rope salesman.

(Continued on page 141)

Continental Supply's Service Award Dinner For Dallas-Fort Worth Employes



Continental Supply Co.'s dinner held in the Texas Room of the Baker Hotel, Dallas, at which 105 employes of the Dallas-Fort Worth group received service pins. Presentation of the awards was made by Fredrick H. Mayer, president; Frank I. Brineger, executive vice president; and Jack A. Mussler, general manager of sales. W. J. Morris, chairman of the board, was presented a three-diamond pin in recognition of his 40-year connection with the company. R. R. Lewis, manager of sales department, and H. A. Jostrand, retired manager of accounts receivable, were awarded 35-year two-diamond pins. Sixty-eight employes were recognized for from 5 to 25 years' employment. There were 34 having service of from 25 to 35 years, who were awarded single-diamond pins

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: New 5½" Casing, 10,000' in Tulsa, 20,000' in Houston, J-55, Range 2, Long T & C. 1800' of 8" Extra Heavy. Box 3498, Shreveport, Louisiana.

FOR SALE: Fred Cooper Model U. E. S. Well service winch equipped with telescope pole and spudder. Rod and tubing capacity 5000'. Spools 6160' ¾ drilling line. Mounted on 1943 G. M. C. 6x6 Truck. Also have ¾" drilling line, drilling tools, fishing jars, etc. Will sell all or part. Geo. Barnard, Madison, Kansas.

FOR SALE—USED STEEL PIPE

40,000 ft. 18" OD x $\frac{5}{16}$" Wall
40,000 ft. 16" OD x ¼" Wall
20,000 ft. 8⅝" OD Standard Weight
25,000 ft. 6⅝" OD Standard Weight

NEW SUBSTANDARD ELECTRIC WELD STEEL PIPE

8,000 ft. 26" OD x ¼" to $\frac{5}{16}$" Wall
9,000 ft. 24" OD to ¼" Wall
20,000 ft. 22" OD x ¼" Wall
10,000 ft. 20" OD x ¼" Wall

UTILITY & INDUSTRIAL SUPPLY CO.
921 Michigan Ave., E. Jackson, Michigan

EQUIPMENT FOR SALE

TWO TOM DIETLE Pipe Pulling Machines, double-drum, double-brake, with spudding attachment. Phones 2-0061 and 7-5013, Tulsa, Oklahoma. Mailing Address: Dietle and Martin, 917 No. Elm, Eureka, Kansas (Phone 1032).

FOR SALE: Three Worthington horizontal duplex hot oil pumps, 23 x 5 x 24, with forged steel liquid ends, rated 750 pounds square inch discharge pressure. Used in refinery operation. Good for irrigation projects, plastic industry, paper plants. Good condition. R. H. Armstrong, Republic Oil Refining Company, Texas City, Texas.

FOR SALE: Wilson Mogul Drilling Rig. Lee C. Moore 87' Jackknife Derrick. Compound GAK Waukesha Motors. 6x16 Wilson Snyder Pump. Capable of drilling 5000 ft. Complete rig in good condition. Terms if desired. Blalack Drilling Company, Box 1145, Gladewater, Texas. Phone 324. Price $35,000.00.

FOR SALE: Approx. 600' of 7" 22# used Seamless Casing, 1500' of 2½" 10thd Seamless used Tubing. Tennant Drilling Co., 210-211 Rivoli Theatre Bldg., Blackwell, Okla.

FOR SALE: One New 1948 ELI Model M-7 Rotary Drill, Truck mounted, complete to start drilling, with 2000' 2⅞" Drill Pipe. One 1947 ELI Model M-6 Rotary Drill, Truck mounted, complete with large light plant, extra U-4 International Engine, large tool house, and misc. hand tools, less drill pipe. $8650.00. One 1947 Franks Model FA Heavy Duty Rotary Drill, Truck mounted, complete with large light plant and portable tool house, less drill pipe. $7500.00. Utility & Industrial Supply Company, Box 168, Mt. Pleasant, Michigan.

NEW **USED**

ALL SIZES

Immediate Shipment

CASING
PIPE
TUBING

Oil—Water Well—Gas

Columbus Steel Supply Co.
UN 1175 — L.D. 394
Columbus 3, Ohio

FOR SALE

We specialize in spot shipments of oil well casing. Listed below are a few of our current offerings:

NEW SEAMLESS OIL WELL CASING

	Price per ft.	F.O.B.
25,000' J-55 5½" OD 14#, 8 Rd. Thr., Range 2	$2.40	Pitts. area
60,000' J-55 5½" OD 15½#, 8 RT, Long Coup., Range 2	2.60	Pitts. area
20,000' N-80 5½" OD 15½#, 8 RT, Long Coup., Range 2	3.00	Okla. City area
60,000' J-55 5½" OD 17#, 8 RT, Long Coup., Range 2	2.70	Pitts. area
13,000' J-55 7" OD 20#, 8 RT, Long Coup., Range 2	2.85	Pitts. area
12,000' J-55 7" OD 23#, 8 RT, Long Coup., Range 2	3.50	Pitts. area
2,740' H-40 8⅝" OD 24#, 8 RT, Long Coup., Range 1	3.15	Pitts. area
3,000' J-55 & H-40 10¾" OD 32¾#, 8 RT, LC, Range 1	5.75	Cent. Mich.

NEW TUBING

30,000' J-55 2⅜" OD Ext. Upset Tubing, 8 RT, Range 2	1.05	Pitts. area

SUBJECT TO PRIOR SALE
USED MATERIAL AT LOWER PRICES WITH CERTIFICATE OF INSPECTION

A. G. GHYSELS CO.
1209 No. State St., Chicago 10, Ill., Superior 7-4412

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

2—M.C. 350 Bethlehem rotary drilling rigs complete with 127' Lee C. Moore Cantilever (Jack-knife) derricks, less drill pipe and drill collars. For further information write Sharp Drilling Company, P.O. Box 1271, Midland, Texas.

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection — Cable Tools For Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

SEVERAL 10¾" and 13⅜" O.D. Used Wilson Side Door Elevators. Also few other sizes and makes. Advise your wants. Zanesville Tool and Supply Company, Zanesville, Ohio.

BUCYRUS-ERIE 36L Spudder, Trailer Mounted, complete with 6, 8 and 10" Spang Tools. Spudder and Tools in A-1 Condition. Box 338, Albany, Kentucky.

BUCYRUS-ERIE 24L Spudder, Trailer mounted; over 5,000 feet line; 2 strings of tools 4 inch to 10 inch; 2½ ton G.M.C. Tandem Dual Truck with detachable A-Frame and winch; 8-ft. x 10 ft. metal tool shed; Kohler Light Plant; 470 ft. new 10 inch wrought iron pipe; some used 6 and 8 inch pipe. All $10,000.00. Lealand West, The Scott County State Bank Building, Scottsburg, Indiana, Telephone 4931 or 4391.

WE wish to reduce our operations to one rig and offer for sale either of the following rigs. 1—U 15 Drawworks 2-NKU motors; 7¼ x 14" Oil Well PHD pump; 2—8' x 6' x 30' factory built slush pits; Reagan BOP; Thompson LR Shaker; 127' Lee C. Moore Mast; Steel Tool house; Steel Pipe racks; water tank; 4-drill collars, B. J. hook, Gumbo Buster 17½ table & etc. Rig complete ready for drilling, has drilled 23,000 ft. of hole. 6800 ft. 4½" drill pipe, Reed shrink grip joints (drilled 18,000 ft. of hole)—Price $100,000.00.

1—U10 Drawworks 2-RXIS LeRoi motors; C-150 pump, Lr Shaker, National hook, block & rotary table; 2—tool houses & etc.; 5700 ft. 4½" drill pipe. Rig complete ready for drilling. Price $40,000.00. B. & B. Drilling Co., Pauls Valley, Oklahoma.

FOR SALE

56 Miles 8" and 28 miles 6" line pipe. Now being lifted in eastern Pennsylvania Interested parties contact

PIPE LINE CONSTRUCTION & DRILLING CO.
Camp Hill, Penna. **Phone 3-7804**

USED STEEL PIPE AND TUBING

100,000 ft. of 1½" O.D., 8 gauge
75,000 ft. of 2" O.D., 10 gauge to 11 gauge
100,000 ft. of 2¼" O.D., 10 to 11 gauge
50,000 ft. of 3¼" O.D., 9 gauge
40,000 ft. of 4" O.D., 10 to 11 gauge
50,000 ft. of 5½" O.D., 8 gauge

All the above is seamless, plain end, hydrostatically tested for 850 lbs. pressure.

16,000 ft. of 3" standard line pipe, 8 thread
25,000 ft. of 6" I.D. welded steel pipe, approx. ⅛" wall, plain end
6,000 ft. of 7" O.D. lapweld casing, 8 thread, 20 lbs.
3,400 ft. of 14" O.D. Naylor spiral welded steel pipe, 14 gauge, 40' lengths, grooved for Victaulic couplings

Reasonable prices. Immediate shipment

Also, bolted, welded and riveted steel tanks for storage and pressure.
600 tons of steel plates from $\frac{1}{16}$" to $\frac{7}{16}$" coming from grain tanks, like new, free of holes.

Please send for our late lists.

A. GREENSPON PIPE CO., INC.
3615 Olive Street **St. Louis (8), Mo.**
Phones Nos. Franklin 0064 and 1606

FOR SALE: Butane storage vessels. Two 34'2" length x 10' diameter x 1-5/32" heads x 1⅛" shell, code welded. $3,300.00 each. Box 610, Mt. Pleasant, Texas.

A REAL VALUE
7500 FOOT DRILLING RIG

Emsco H46 Draw Works (Reconditioned) new brake drums, sprockets and chains, 40" type RC hydromatic brake, double deck Regan crown block, 4 sheave gumbo buster traveling block, B6 Emsco swivel, 27½" Emsco oil bath rotary table, gumbo buster 8" hook, 7¼" x 18" Wilson Snyder power pump with 200 HP DC Westinghouse electric motor, 2—300 HP, 900 RPM, Sterling Viking gas-butane engines with 175-150 DC Westinghouse generators, Marley cooling tower, approximately 8000 Ft. 4½" OD, 1660# Spang Grade-D drill pipe with Reed Super Shrink Grip Tool Joints, made three wells, rig complete with all accessories, located southern Oklahoma. Inventory on application. Price to sell F.O.B. location, $65,000.00. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

FOR SALE: Three new Buda PCD1879 Diesel Engines. Engines are complete with radiator but less flywheel housings. A real buy at $5,800 each. Also one new 140 HKU Waukesha multi-fuel engine with all Hesselman parts included. Price $1,200. Box C-761, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: One rotary drilling rig complete, capable of drilling to 4,000 feet with ease. Powered with two 6 Cyl. 185 H.P. G.M.C. Diesel motors. 7¼ x 12 Gardner-Denver pump that has only drilled 2—3,000' wells. 86' mast made out of 4½" drill pipe. Raises same as L. C. Moore and only drilled one well. Complete with approximately 2,500 feet 4½-inch Range 2, F. H. drill pipe. Will sacrifice for $25,000.00. Alide Wells Company, 1449 South Broadway, Denver, Colo.

FOR SALE: 1 Cardwell Model "M" Double Drum Mobile hoist with 55 ft. double pole, Caterpillar Motor, fully equipped, 6" x 12" pump. Everything for workover or shallow drilling. Box C-763, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

Three 8000' capacity steam rigs complete with 129' releg derricks and substructure, blowout preventers, drill pipe, and everything ready to put to work. Rigs located at or near Alice, Tex.

For further information, write

AL BUCHANAN DRILLING COMPANY
2114 Alamo National Bldg.,
San Antonio, Texas

or Frank Buchanan, c/o Al Buchanan Drilling Company, Box 1308, Alice, Texas

IN STOCK FOR IMMEDIATE DELIVERY

NEW PLAIN HOT ROLLED MILD STEEL SHEETS AND PLATES IN STOCK IN NEW YORK

Approx. 150 tons—12 USG Size 36" x 96"
In Stock in New York and Baltimore
Approx. 220 tons ¼" Size 60" x 180" or 60" x 240"
For February Shipment to North Atlantic or Gulf Ports
Approx. 125 tons 10 USG Size 60" x 120" or 60" x 144"
Approx. 125 tons ⅛" (11 USG) Size 60" x 120" or 60" x 144"

FABRIKANT
Steel Products, Inc.
50th Floor—Woolworth Bldg.
NEW YORK 7, N. Y. BEekman 3-3041
CABLE ADDRESS: FABKANT, NEW YORK
MEMBER Association of Steel Distributors

FOR SALE: 1—7¼" X 15' Drill Collar (good condition)—$400.00; 1—6¾" X 23' Drill Collar (good condition)—$500.00; 1—7 X 12 Star Steel Tool House—$300.00; 1—4,000 Gallon Butane Tank like new, skidded, can license anywhere—$1600.00. Phone 4-1213, Wichita, Kansas.

PIPELINE Construction Equipment for Sale: Pipe cleaning machine with priming head, traveling or stationary, 6" to 12", excellent condition, $1,350. Two T40 International tractors with pipelayer attachments, good condition, very cheap. Contact C. W. Sternberg, 8250 Wier Drive, Houston, Texas. Phone Preston 7043.

PIPE FOR SALE: A-1 used lapweld pipe at low prices. 7" OD 17# casing at $1.35 per foot, 5½" OD 13# casing at $1.35 per foot, 2⅜" OD 4½# tubing at 36 cents per foot. Write A. A. Staub, 2027 16th St., Parkersburg, W. Va., Phone 895.

FOR SALE: Near Burrton, Kansas, 1—18' x 101' x 35' Fluor Atmospheric Cooling Tower Model 12-N with 4 wood water pans Standing. Cities Service Oil, Patridge, Bartlesville, Okla.

SHOT hole drill on Ford truck, Hyd. lift mast, chain pull down, 3" solid kelly, 4½" x 6" G. D. pump, twin disc clutches. $5000.00. Waters Drilling Service, 69 Beacon Place, Pasadena 8, Calif.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

MURPHY DIESEL, ME-66

Brand New—Sacrifice—At OEM's Cost 1103 cu. in., 6-cylinder, 180 HP, @ 1200 RPM. Never been used. 20% off list. Contact: Box C-613, The Oil and Gas Journal, Tulsa, Oklahoma.

STEEL TANKS IN STOCK

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CALENDAR OF EVENTS

February

Conference on Reservoir Engineering, University of Texas, Austin, Tex., February 8-10.

American Institute of Mining and Metallurgical Engineers, annual meeting, Fairmont Hotel, San Francisco, February 13-17.

American Society for Testing Materials, spring meeting and A.S.T.M. committee week, Hotel Edgewater Beach, Chicago, Ill., February 28-March 4.

March

American Petroleum Institute, Southwestern district, Galvez Hotel, Galveston, Tex., March 9-11.

American Association of Petroleum Geologists, regional meeting; Society of Exploration Geophysicists, and Society of Economic Paleontologists and Mineralogists, Jefferson Hotel, St. Louis, Mo., March 14-17.

American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa, March 23-25.

New England Gas Association, Hotel Statler, Boston, March 24-25.

Western Petroleum Refiners Association, thirty- seventh annual meeting, Plaza Hotel, San Antonio, Tex., March 28-30.

American Chemical Society, division of petroleum chemistry, spring meeting San Francisco, March 27-April 1.

April

Texas Independent Producers and Royalty Owners Association, Houston, April 1.

American Petroleum Institute, division of Refining, mid-year meeting, Shamrock Hotel, Houston, April 4-7.

American Society of Lubrication Engineers, annual meeting, Pennsylvania Hotel, New York, April 11-13.

National Association of Corrosion Engineers, annual convention, Netherlands Plaza Hotel, April 11-14, Cincinnati, Ohio.

Southwestern Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., April 12-14.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

Natural Gasoline Association of America annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

American Petroleum Institute, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

May

Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, La., May 3-4.

American Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-10

Interstate Oil Compact Commission, spring quarterly meeting, Roosevelt Hotel, Jacksonville, Fla., May 10-12.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13.

Instrument Society of America, annual spring meeting, Royal York Hotel, Toronto, Canada, May 12-13.

Oil-Heat Institute of America, national oil-heat exposition and annual convention, Boston, Mass., May 16-20.

American Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

Natural Gas and Petroleum Association of Canada, annual meeting, Hotel London London, Ont., Canada, May 26-27

Fourth Annual Short Course in Gas Technology, sponsored by Southern Gas Association, Texas College of Arts and Industries, Kingsville, Tex., May 30-June 1.

June

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 17-July 1,

Pennsylvania Grade Crude Oil Association annual meeting, Hotel William Penn, Pittsburgh, Pa., June 16-17.

September

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

October

National Lubricating Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Gas Association, annual convention, Chicago, Ill., October 17-20

NOMADS

Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Oil Refining Companies Up Dividend Payments in 1948

WASHINGTON.—Publicly announced dividend payments of corporations engaged in oil refining amounted to $538,000,000 last year, compared with $490,100,000 in 1947, according to figures compiled by the Department of Commerce.

The figures showed, however, that dividends dropped sharply toward the close of the year, those announced in December amounting to only $153,-300,000, compared with $173,400,000 in the same month of 1947.

The department explained that its figures on dividend payments by all corporations account for about 60 to 65 per cent of all gross cash dividends paid. They indicated, on the basis of $6,074,200,000 publicly announced, that investors in American corporations last year drew down more than one billion dollars in dividends.

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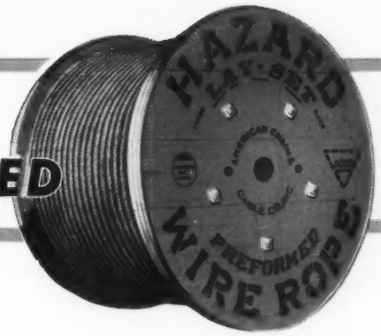
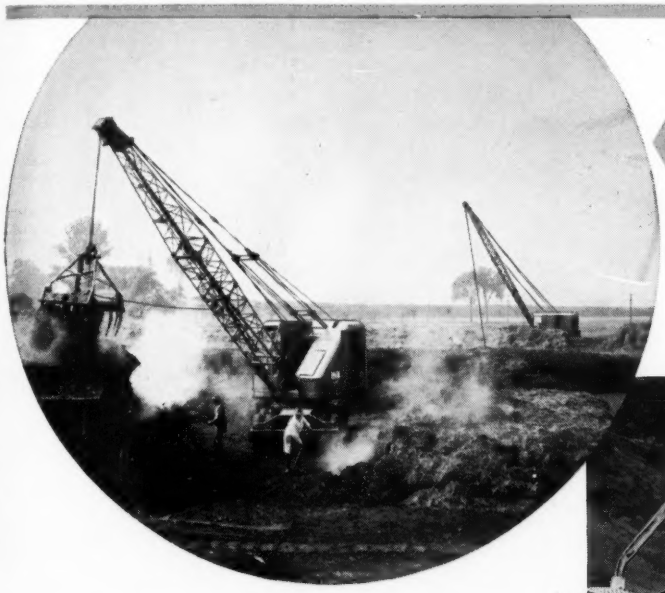
Improved Performance with LAY-SET PREFORMED





Cranes are ever useful in industry, contracting, and mining. Whether it's manure for mushroom growing (as illustrated), or sand, gravel, coal, blasted rock or ore, or fabricated products, cranes are in there lifting. Hazard LAY-SET Preformed comes in just the right construction, grade and size for improved crane performance.

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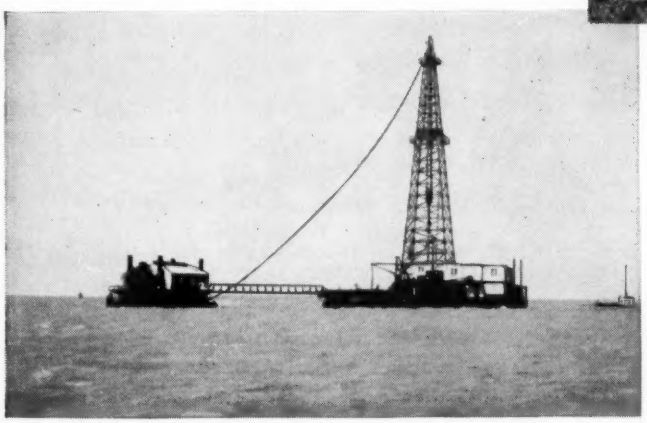

In his quest for more oil, man now drills below the water . . . and the holes are pushed ever deeper. Greater depths and greater weights challenge the quality of wire ropes. Hazard LAY-SET is the finest rotary drilling line. It has the handling qualities that drillers like. It improves performance. It costs less to use. It is a better line.

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